Architectural Library FEB 6 1922

THE BUILDER
A JOURNAL FOR THE ARCHITECT & CONSTRUCTOR

VOLUME CXXII. No. 4119. *Eightieth Year.*

FRIDAY, JANUARY 13, 1922.
REGISTERED AT THE GENERAL POST OFFICE AS A NEWSPAPER.

PRICE NINEPENCE. *By Post 11d. (This Week)*

"I have seen several different forms of Mr. Boyle's 'Air-Pump' Ventilator in actual operation, and have much pleasure in testifying to their efficiency."—LORD KELVIN.

Boyle's
LATEST "PATENT AIR-PUMP" VENTILATOR.
Has DOUBLE the EXTRACTING POWER of Earlier Forms
Awarded the £50 Prize with Grand Diploma (only prize offered), at the International Ventilator Competition, London. Highest Award, International Ventilator Competition, Paris, Two Gold Medals.
"Mr. Boyle's complete success in securing the required continuous upward impulse is testified to by high authorities."—GOVERNMENT REPORT (Blue Book).
ROBERT BOYLE & SON,
Ventilating Engineers,
64, HOLBORN VIADUCT, LONDON.
"Messrs. Robert Boyle and Son, the founders of the profession of Ventilation Engineering, have raised the subject to the dignity of a science."—REPORT ON THE VENTILATION OF THE LONDON CUSTOM HOUSE.

HEATING
ROSSER & RUSSELL, Ltd.
(MAYFAIR 3210)
37 DUKE STREET, OXFORD STREET, LONDON, W.1

ARTESIAN WELLS
AUTOMATIC SILENT
LONDON HYDRAULIC POWER CO.
HATFIELD STREET, S.E.1. HOP 4540

THE LIFT & HOIST Co.
Sole Makers of "Premier" Rolling Shutters.
108-114, Prince Street, DEPTFORD, S.E.

WAYGOOD-OTIS LIFTS
54 & 55, FETTER LANE, LONDON, E.C.4
62 & 63, LIONEL STREET, BIRMINGHAM
and Principal Provincial Cities.

TITAN LIFTS
30, HIGH HOLBORN, W.C. Telephone—CHANCERY 7061

MARRYAT-SCOTT LIFTS
28, HATTON GARDEN LONDON, E.C.

THE EXPRESS LIFT CO., LD.
GREYCOAT STREET WORKS,
WESTMINSTER S.W.1
ALL TYPES.
Phone: Victoria 6115 (3 lines).

HOT WATER INSTANTLY
NIGHT or DAY
EWART'S GEYSERS
346 EUSTON ROAD, LONDON, N.W.
Price List on application.
Telegrams; GEYSER, LONDON. 'Phone; MUSEUM 2570

MODELS OF WORKS BUILDINGS ESTATES, etc.
Executed by JOHN B. THORP,
98, Gray's Inn Road next to Holborn Hall,
Phone Holborn, 1011 LONDON, W.C.1

THE
SEYSSEL & METALLIC LAVA ASPHALTE CO.
Mr. G. F. GLENN, *Proprietor.*
MOORGATE STATION CHAMBERS, E.C.2.
Telephone: LONDON WALL 262.

THE PATENT
FORESIGHT
COMBINATION RANGE
S. SMITH & SONS, LTD., Beehive Foundry, Smethwick.

SEYSSEL
ASPHALTE ROOFS
RAGUSA ASPHALTE Co., Ltd
TREDEGAR ROAD, LONDON, E.3.

JOISTS ~~BARS~~ JOISTS
PROMPT DELIVERIES FROM STOCK AND WORKS—ALL SIZES
SEND FOR STOCK LIST
HELICAL BAR CO. 72 VICTORIA STREET, S.W.1
Telegrams: "HELISTELBA, SOWEST, LONDON." Telephone: VICTORIA {1940 1941

PARTITION SLABS
PHONE: PARK 1730
CONCRETE SLABS CO.
Wood Lane, SHEPHERDS BUSH

VAN KANNEL REVOLVING DOOR CO.,
LIMITED.
Original Inventors,
Patentees & Manufacturers.
Established 1899.
ONLY ADDRESS: WATFORD. Tel. 402.

STUART'S GRANOLITHIC
Co., Ld. (Founded 1840)
CONCRETE SPECIALISTS,
3, LINCOLN'S INN FIELDS, LONDON, W.C.

LIFTS A. & P. STEVEN
PROVANSIDE WORKS, GLASGOW.
London Office: 10 Charles Street, Blackfriars Road, S.E.
Manchester Office: 12 Charles Street.

STEEL INTERLOCKING FIREPROOF ROLLER DOORS
HAND **LIFTS** POWER
HASKINS
OLD ST LONDON, E.C.1

CONVEYOR INSTALLATIONS FOR FACTORIES, WAREHOUSES, WHARVES
"Mathews" Gravity Conveyors,
Spiral Chutes and Elevators.
W. & C. PANTIN,
ENGINEERS,
147, 148, UPPER THAMES ST., E.C.4

STEEL BARS
MILD and OTHER QUALITIES.
ROUNDS and SQUARES
From $\frac{1}{16}$in. to 2$\frac{1}{2}$in.
HEXAGONS for BRIGHT DRAWING
From $\frac{1}{4}$in. to 2in.
FLATS from $\frac{1}{2}$in. to 4in. down to $\frac{1}{16}$in. in the narrower widths.
HOOPS and STRIPS.
FERRO CONCRETE BARS
A SPECIALITY.
WOLVERHAMPTON STEEL AND IRON CO., LTD.,
OSIER BED WORKS,
WOLVERHAMPTON.
Telegrams: "Osier, Wolverhampton," Tel.: 588 W'ton. London Office: 17, Victoria St., S.W.1

LIFTS OF ALL TYPES
SMITH, MAJOR & STEVENS, Ltd.
LONDON & NORTHAMPTON.

Analysis of Advertisements.

Acetylene Lighting—
Moyes, Wm. & Sons

Architectural Decorators—
Battiscombe & Harris
Martyn, H. H. & Co., Ltd.

Aerated Water Machines—
Fluge! & Co., Ltd.

Artificial Stone—
Brookes Ltd
Cambridge Artificial Stone Co.
Concrete Units Co.
Empire Stone Co., Ltd.
Patent Impervious Stone.
Stuart's Granolithic Co., Ltd.
Warren, R. & G., Ltd.

Asbestos Tiles & Sheets—
Asbestos Roofings Co
Bell's United Asbestos Co.
British Everite & Asbestilite Works, Ltd.
British Fibrocement Works.
British Roofing Co., Ltd.
British Uralite Co. (1908) Ltd
Machin & Kingsley, Ltd.
Martinit Slate & Sheet Co. Ltd
Sankey, J. H. & Son, Ltd.
Speaker, G. R. & Co.

Asphalte—
Engert & Rolfe Ltd.
Faldo's.
Hobman, A. C. W. & Co. Ltd.
Limmer & Trinidad Lake Co.
Ragusa Asphalte Co., Ltd.
Robertson, F. J. L.
Seyssel and Metallic Lava Asphalte Co.
Val de Travers Asphalte Co.

Barrows—
Cayless Bros. (Battersea)
Rowland Bros.
Stephens & Carter, Ltd.
Trollope & Colls, Ltd.

Bells, &c—
Carr, Chas. Ltd.
Gillett & Johnston.

Bitumen Sheeting—
Callender, Geo. M. & Co. Ltd.
Engert & Rolfe Ltd.
McNeill, F. & Co., Ltd.
Vulcanite Ltd.
Wailes Dove Bitumastic, Ltd.

Blind Cords—
Austin, J. & Sons, Ltd.

Blinds (Window, &c)—
Bryden, John, & Sons
Francis, S. W. & Co., Ltd.
Haskins, S. & Bros.
Williams, G. A. & Son.

Boilers—
Acrogen Co., Ltd.
Associated Metal Supply Co.
Danks, H. & T. (Netherton).
Hartley & Sugden, Ltd.
Jenkins, Robert, & Co. Ltd.
Kinnell, Chas. P. & Co., Ltd.
Lumbys, Ltd.
Wood, Russell & Co.

Bricks—
Builders' Material Association
Burley, C., Ltd.
Dennis, Henry
Eastwoods, Ltd.
Lawford & Sons, Ltd.
Leeds Fireclay Co., Ltd.
Rufford & Co.
Sankey, J. H., & Son, Ltd.
Smeed, Dean & Co., Ltd.
Warren, R. & G., Ltd.
Young & Son.

Builders' Ironmongery—
Burnell & Co., Ltd.
Colledge & Bridges
Hodge, Fred, Ltd.
Nicholls & Clarke.
O'Brien, Thomas & Co.
Shaw & Carter, Ltd.
Wilson, G. L. & Co., Ltd.
Young & Marten, Ltd.

Building Contractors—
Arding & Hobbs, Ltd.
Higgs & Hill, Ltd.
Holliday & Greenwood, Ltd.
Mansell, R.
Smith, J., & Sons
Somerville, D. G. & Co., Ltd.
Williams, Howell J., Ltd.

Cartage Contractors—
Acme Cartage Co., Ltd.
Bissell, J. A.
Hudsons, Ltd.
Mears, Joseph.

Castings—
Baker & Co.
Bayliss, Jones & Bayliss, Ltd
Haywards Ltd. [Ltd.
Humphries, Jackson & Ambler
Nicholls & Clarke Ltd.
Smith, S. & Sons, Ltd.
Young & Marten Ltd.

Cement, Lime, Plaster—
Adamite Co., Ltd.
Assoc. Portland Cement Mftrs
British Portl'd Cement Mftrs
Builders' Material Associatn
Burley, C., Ltd.
Cement Marketing Co.
Eastwoods, Ltd.
Greaves, Bull & Lakin Ltd.
Kaye & Co., Ltd.
Oxford Portland Cement Co.
Sankey, J. H. & Son, Ltd.
Smeed, Dean & Co., Ltd.
Super Cement, Ltd.
Warren, R. & G. Ltd.
Wouldham Cement Co.
Young & Son.

Cement Waterproofing—
Bareau.
Colmanite
Ironite Co., Ltd.
Pudlo.
Pruft.
Sankey, J. H. & Son, Ltd.

Clocks (Church & Tower)—
Gillett & Johnston.

Chimney Cowls, &c.—
Bryant & Sons, Ltd.
Collins, A. J.
Ewars & Son, Ltd.
Farmiloe, Geo. & Sons, Ltd.
Nicholls & Clarke, Ltd.
Young & Marten Ltd.

Chimney Shafts—
Aldington.
Chimneys Limited.
Panks, H. & T.
Purse, W. J.

Concrete Machinery—
Australia Pat. Concrete Block
British Lean Co., Ltd.
Builders and Contractors Plant, Ltd.
Byrd, A. A. & Co.
Chalmers-Edina Co
Hartley, Limited
Ingersoll-Rand Co., Ltd
Liner Concrete Machinery Co.
Millars' Timber & Trading Co.
Parker, P. [Ltd
Parker, Winder & Achurch
Ransome Machinery Co. Ltd.
Stothert & Pitt.
Vickers, Ltd.
Whitaker, R. G., Ltd.
Winget, Ltd.

Coatostone—
Coatostone Decoration Co.

Concrete Piling—
Simplex Concrete Piles, Ltd
Somerville, D. G. & Co., Ltd

Concrete Specialties—
Acme Cartage Co., Ltd.
Brown & Tawse, Ltd.
Building Products, Ltd.
Cardwell, J. L. & Co., Ltd.
Concrete Blocks, Ltd.
Concrete Slabs Co.
Concrete Units Co.
Gloucester Concrete Construction Co., Ltd.
Helical Bar & Engineering Co.

Concrete (Reinforced)—
British Reinforced Concrete
Concrete Units Co.
Expanded Metal Co., Ltd.
Fawcett Construction Co., Ltd
Indented Bar & C. Eng. Co.
Johnson's Reinforced Concrete
Lind, Peter & Co.
Patent Impervious Stone Co.
Self-Centering Ex. Metal.
Somerville, D. G. & Co., Ltd.
Stuart's Granolithic Co., Ltd.
Stewart, J. & W.
Trollope & Colls, Ltd
Trussed Concrete Steel Co., Ltd.

Contractors' Plant—
Boyer, Henry.
Builders and Contractors Plant, Ltd.
Builders' Material Association
Building Products, Ltd.
Byrd, A. A., & Co.
Cayless Bros. (Battersea)
Lewis & Lewis, Ltd.
Palmer's Travelling Cradle.
Parker, P. & Co. Ltd.
Ransome Machinery Co. (1920)
Rom River Co., Ltd.
Rowland Bros.
Ruston & Hornsby, Ltd.
Stephens & Carter, Ltd.

Copper Piping—
Fyffe, D. Rodger & Co.

Cork Articles—
Dutton & Sons, Leonard.

Cork Insulations—
Duttons & Sons, L.

Cranes, Excavators, &c.—
Ruston & Hornsby, Ltd.

Damp Proof Courses—
Briggs, W., & Sons, Ltd.
Building Products, Ltd.
Callender, Geo. M. & Co., Ltd.
Engert & Rolfe, Ltd.
Hobman, A. C. W. & Co., Ltd.
Ironite Co. Ltd. (The)
Kerner-Greenwood & Co (Pudlo
McNeill, F. & Co., Ltd.
Permanite, Ltd.
Ragusa Asphalte Co., Ltd.
Vulcanite, Ltd.

Decorators' Dust Sheets—
Moore, W. & Co.

Demolition—
Boyer, Henry
Grenham, Henry J
Hudsons, Ltd.

Doors (Iron, Steel, &c)—
Dennison, Kett, & Co., Ltd.
Gibbs, John, Ltd.
Gibson, Arthur L.
Haywards, Ltd.
Hobbs, Hart & Co., Ltd.
Humphries, Jackson & Ambler,
Lift & Hoist Co.
Mather & Platt, Ltd. [Co.
Van Kannel Revolving Door

Door Hangers & Rollers—
Bousfield's Ironworks.
Henderson, P. C., Ltd.
Nicholls & Clarke, Ltd.
O'Brien, Thomas, & Co.
Parker, Winder & Achurch.
Young & Marten, Ltd.

Door Springs and Hinges—
Nicholls & Clarke, Ltd.
Protector Lamp & Lighting Co.
Young & Marten, Ltd.

Drawing Instruments—
Baker, C.
Clarkson's.

Dust Bins—
Butterfield, W. P., Ltd.
Harvey, G. A. & Co. (London)

Electric Lamps—
Mazda.

Electric Lighting & Fittings—
Dalarn Engineering Co.
General Electric Co., Ltd.
Mather & Platt, Ltd.
Troy & Co., Ltd.

Engines, Mortar Mills—
Lewis & Lewis, Ltd.

Facias, &c.—
Francis S. W. & Co., Ltd.
Haskins, S., & Bros., Ltd.
Jones S & Co.

Felt—
Anderson, D., & Son, Ltd.
Engert & Rolfe, Ltd.
Gibson, Arthur L.
McNeill, F., & Co., Ltd.
Sankey, J. H., & Son, Ltd.

Fencing (Wood, &c.)—
Fernden Fencing Co., Ltd.
Ford, H. J.
"Invicta" Fencing Co.
Neville Hine & Co.
Quenby, Fry & Co.
Rowland Bros.

Fire Engineers—
Pyrene Co., Ltd.

Fire Escapes, Staircases—
Clark, Hunt, & Co., Ltd.
Davis, H. & C., & Co., Ltd.
Haywards, Ltd.
Lift & Hoist Co.

Fireproof Flooring, &c.—
Bell's United Asbestos Co.
British Reinforced Concrete
Building Products, Ltd. (Ferrolithic).
Dawnay, A. D., & Sons. Ltd
Eastwoods, Ltd.
Expanded Metal Co., Ltd.
Haywards, Ltd.
Homan & Rodgers, Ltd.
Ironite Co., Ltd.
King, J. A. & Co.
Kleine Pat. Flooring Co., Ltd.
Sankey, J. H., & Son, Ltd.
Siegwart Fireproof Floor Co.
Somerville, D. G. & Co., Ltd.
Thermos Flooring Co., Ltd.

Flint Paper—
Oakey, J., & Sons. Ltd.

Folding Partitions—
Educational Supply Assoc. Ltd
Henderson, P. C., Ltd.
Lift & Hoist Co.

Galvanizers—
Burnell & Co., Ltd.
Butterfield, W. P., Ltd.
Cochrane, John
Harvey, G. A. & Co. (London)

Garden Hose—
Wilcox, W. H., & Co., Ltd.

Gates (Collapsible)—
Acme Metal Works.
Hostwick Gate Co., Ltd.
Dennison, Kett, & Co., Ltd.
Haywards, Ltd.
Lift & Hoist Co.
Round A. K.

Gates, Railings (Iron) &c.—
Bayliss, Jones & Bayliss, Ltd
Haywards, Ltd. [Ltd.
Humphries, Jackson & Ambler,
Nicholls & Clarke, Ltd.
Smith, S. & Sons. Ltd
Young & Marten, Ltd.

Gates (Wood)—
Rowland Bros.

Glass (Embossing)—
Eaton, Parr & Gibson Ltd.

Glass (Plate & Window)—
Borton, H., & Co.
British Luxfer Prism Synd.
Clark, J., & Son, Ltd.
Eaton, Parr & Gibson, Ltd.
Farmiloe, Geo. & Sons, Ltd.
Haywards, Ltd. [Ltd.
Humphries, Jackson & Ambler,
King, J. A. & Co.
Newton, J. M. & Sons, Ltd.
Nicholls & Clarke.
Pilkington Bros., Ltd.
Young & Marten, Ltd.

Glass Paper—
Oakey, J., & Sons. Ltd.

Glass (Stained, Painted)—
British Luxfer Synd., Ltd.
Clark, J., & Son.
Eaton, Parr & Gibson, Ltd.
Farmiloe, Geo. & Sons, Ltd.
Gibbs, W., & Sons, Ltd.
Haywards, Ltd. [Ltd.
Humphries, Jackson & Ambler
King, J. A., & Co.
Nicholls & Clarke.
Young & Marten, Ltd.

Glazing—
Borton, H., & Co.
Braby, F., & Co., Ltd.
British Challenge Glazing Co.
British Luxfer Synd., Ltd.
Eaton, Parr & Gibson, Ltd.
Farmiloe, Geo. & Sons, Ltd.
Freeman's.
Grover & Co., Ltd.
Haywards, Ltd.
Heywood, W. H. & Co.
Helliwell & Co., Ltd. [Ltd.
Humphries, Jackson & Ambler
King, J. A., & Co.
Nicholls & Clarke, Ltd.
Wolton & Son.
Young & Marten, Ltd.

Gutter Brackets—
Parker, Winder & Achurch.

Heating and Lighting—
Acrogen Co., Ltd.
Associated Metal Supply Co.
Clark, Hunt, & Co., Ltd.
Dunham, C. A. & Co., Ltd.
Ewart & Son, Ltd.
Hartley & Sugden, Ltd
Haywards, Ltd.
Kinnell, Chas. P. & Co., Ltd.
Messenger & Co.
Murray, S. D., & Co., Ltd.
Musgrave & Co., Ltd.
Nicholls & Clarke, Ltd.
Parker, Winder & Achurch, Ltd
Rosser & Russell, Ltd.
Self Engineering Co., Ltd.
Smith S & Sons Ltd.
Spencer, W. F.
Tredegars, Ltd.
Waring, Withers & Chadwick
Young & Marten, Ltd.

Hot Water Supply—
Associated Metal Supply Co.
Clark, Hunt & Co., Ltd.
Dargue, Griffiths & Co., Ld.
Ewart & Son, Ltd.
Fildes, Thos.
Hurry Water Heater Co.
Jenkins, Robert, & Co., Ltd.
Keith, James, & Blackman.
Murray, S. D., & Co., Ltd.
Potterton, Thos.
Rosser & Russell, Ltd.
Watson, A. P. & Co.
Wood Russell & Co.

Hydraulic Power—
London Hydraulic Power Co.

Insurance—
London & Lancashire Fire.
Timber Trades Mutual Accident

Ironite—
Ironite Co., Ltd

Joinery, Mouldings, &c.—
Austins (Bas. Ham & Ilford)
Beal, W. H., Ltd.
Boulton & Paul, Ltd.
Falcon Works, Ltd.
Foulds, Arthur, Ltd.
Gosport Cabinet & Joinery Works.
Heal & Son.
Hobbs, W. J.
Malmo Joinery Works
Morley, E., & Sons.
Newman, John, Ltd.
Ogilvie & Co.
Orfeur, C. E., Ltd.
Peacock, Chas., & Co.
Polden & Authers.
Slade Geo., & Co., Ltd.
Trojan Joinery Works
Tucker, W. Duncan, & Sons.
Welch, J. R. & Co., Ltd.
West Heath Joinery Works.
White, John P. & Sons Ltd.
White, W. J. & Sons.
Williams, E. Lloyd & Co.

Jointless Flooring—
Bell's United Asbestos Co.
Brentford Construction Co.
British Dolomeat Co., Ltd
British Magnesite Flooring Co.
Durato.
Ebner, J. F
King, J. A., & Co.
Lincolite Composition Co.
Marble Mosaic Co.
Nuroads, Ltd.
Thermos Flooring Co., Ltd.
Tramontini, O.
Wilfley Co., Ltd.
Wire, A. B. & Co.

Ladders—
Cayless Bros. (Battersea).
Cookle, H. L.
Eastwoods, Ltd.
Lawford & Sons, Ltd.
Parker & Co.
Stephens & Carter.
Thomas, H. Johnston.
Trollope & Colls, Ltd.

Laundry Appliances—
Bradford, T., & Co., Ltd.

Letters, &c.—
Francis, S. W., & Co., Ltd.
Jones, S. & Co.

Lead, Oil, Colours, Size, &c—
Builders' Material Association
Farmiloe, Geo. & Sons, Ltd.
Farmiloe, T. & W., Ltd.
Hodge, Fred, Ltd.
Nicholls & Clarke.
Young & Marten, Ltd.

Lifts, Hoists, Cranes, &c.—
Bryden, John, & Sons.
Dennison, Kett & Co., Ltd.
Express Lift Co., Ltd.
Haskins, S., & Bros., Ltd.
Henderson, P. C., Ltd.
Hoisting Appliance Co.
Lewis & Lewis, Ltd.
Lift & Engineering, Ltd.
Lift & Hoist Co.
Marryat-Scott.
Medway's.
Smith, Major & Stevens, Ltd.
Steven, A. & P.
Titan Lift Co., Ltd.
Vaughan Crane Co., Ltd.
Wadsworth, W. & Sons, Ltd.
Waygood-Otis Ltd.

Lightning Conductors—
Aldington, G.
Purse, W. J.

Locks, Latches, &c.—
Baldwin
Colledge & Bridges
Fairfax Eng Co.
Henderson, P. C., Ltd.
Hobbs, Hart & Co., Ltd.
Nicholls & Clarke, Ltd.
Protector Lamp & Lighting Co
Shaw & Carter, Ltd.
Young & Marten, Ltd.

Machinery—
Becker, R. & Co., Ltd.
Johnson, C. H., & Sons, Ltd.
Parker, P.
Sagar, J. & Co., Ltd.
Wadkin & Co.
Watts Bros. (Sheffield), Ltd

Marble— [Ltd.
Art Pavements & Decorations
Bryon & Co.
Ebner, J. F.
Kelly & Co.
Manu-Marble Co.
Marble Mosaic Co.
Moore, M. & R.
Vitrolite Construction Co. (Europe), Ltd.
Webb, Percy C., Ltd.

Metaforms—
Byrd, A. A., & Co.

Metal Casements—
British Luxfer Syndicate Ld.
Farmiloe, Geo. & Sons, Ltd.
Gibbs, J., Ltd.
Haskins, S. & Bros., Ltd.
Haywards, Ltd. [Ltd.
Humphries, Jackson & Ambler,
Maclean & Co.
Nicholls & Clarke, Ltd.
Smith, S. & Sons, Ltd.
Standard Metal Windows Co.
Williams, Gamon & Co.
Young & Marten, Ltd.

Metal Work—
Cashmore, H. W. & Co., Ltd.
Humphries, Jackson & Ambler, Ltd.
Marshall, R. E. & C., Ltd.
Osborne, F. & Co., Ltd.
Shrivell, Wm., Ltd.

Model Makers—
Partridge's Models, Ltd.
Thorp, J. B.

Mosaic Work— [Ltd.
Art Pavements & Decorations
Bryon & Co.
Brookes, Ltd.
Ebner, J. F
Marble Mosaic Co.
Maw & Co., Ltd.
Moore, M. & R.
Vitrolite Construction Co. (Europe), Ltd.

Motor Vehicles, Transport—
Keith & Boyle (Lds.), Ltd.
Maudslay Motor Co.
Tuke & Bell, Ltd.

Paints, Stains, Varnish—
Blundell Spence & Co., Ltd
British Ensaulite Co., Ltd.
Builders' Material Association
Clark, Robt. Ingham & Co., Ltd.
Cory, Horace & Co., Ltd.
Cuirass Products, Ltd.
Dixon's White, Ltd.
Farmiloe, Geo. & Sons, Ltd
Farmiloe, T. & W., Ltd
Fraser, John, & Co.
Gay, R., & Co., Ltd.
Indestructible Paint Co. Ltd.
Lefranc & Co.
Naylor Brothers (London), Ltd.
Nicholls & Clarke, Ltd.
Nobles & Hoare, Ltd.
Rose, Sir A. W., & Co., Ltd.
Sankey, J. H. & Son, Ltd.
Silicate Paint Co.
Stephens, H. C.
Wilson, G. L. & Co.
Young & Marten, Ltd.

Parquet Flooring—
Artistic Flooring and Decorating Co. [Ltd.
Art Pavements & Decorations
Damman & Co.
Ebner, J. F.
Stevens & Adams, Ltd.
Turpin's.
Zeta Wood Flooring Co.

Partitions, Slabs, &c.—
British Uralite Co. (1908).
Builders' Material Association
Burton Bldg. Block & Partition Slab Co.
Cambridge Artificial Stone Co.
Concrete Blocks, Ltd.
Concrete Slabs Co.
Concrete Units Co.
Educational Supply Co., Ltd.
Expanded Metal Co., Ltd.
Friends, A. L. & Co.
Jones, Fredk., & Co., Ltd.
King, J. A., & Co.
Lawford & Sons, Ltd. [Ltd.
Muribloc (Partition Slabs).
Sankey, J. H., & Son, Ltd.
Thames Mills.
Wright, J., & Co.
Wright, S. & Co., Ltd.

Pavement, &c. Lights—
British Luxfer Prism Synd.
Haywards, Ltd.
King, J. A., & Co.
Maclean & Co.

Picture Cords—
Austin, J. & Sons, Ltd.

Plumber's Brasswork—
Self Engineering Co., Ltd.

Portable Buildings—
Gibbs, John, Ltd.
Henderson, P. C., Ltd.

Pumps, Pumping Engines—
Braby, F., & Co., Ltd.
Chalmers-Edina Co.
Phœnix Engineering Co., Ltd.
Pulsometer Engineering Co.
Willcox, W. H. & Co., Ltd.

Rawlplugs—
Rawlplug Co.

Rooflights—
Braby, F., & Co., Ltd.
British Luxfer Prism Synd.

Roofing Compounds—
Callender, Geo. M. & Co., Ld.
Cuirass Products.
"Parotex."

Roofing (Felt)—
British Roofing Co., Ltd.
Certain-teed Products.
Cuirass Products, Ltd.
McNeill, F., & Co., Ltd.
Vulcanite, Ltd.

Roofings (various brands)—
"Alligator" (British Roofing Co., Ltd.)
Certain-teed Products.
"Challenge" (Briggs & Sons)
"Lion" (F. McNeill & Co.)
Permanite, Ltd.
"Rok" (D. Anderson & Son, Ld.)
"Ruberoid" (Ruberoid Co. Ld.)
"Vulcanite" (Vulcanite, Ld.)

Roofs (Belfast)—
Partridge, T., & Co.

Roofs (Zinc and Copper)—
Braby, F., & Co., Ltd.
Ewart & Son, Ltd.
Harvey, G. A. & Co. (London)

Ropes (Fall and Scaffold)—
Brown, J. H., & Co.

WHY BUY FOREIGN-MADE DOORS

When you can obtain Trade Union London-Made

5-ply Panel 1¼" 6' 6" × 2' 6" Doors for 21/6

FROM

GEO. SLADE & COMPY., LTD.

SPECIAL DEPARTMENT FOR STAIRS & HANDRAILS

Reg. Office
3, BARNSBURY PARK
LONDON, N.1.
PHONE NORTH 199.

SEPARATE FACTORY FOR OFFICE FURNITURE

THE BUILDER

A JOURNAL FOR THE ARCHITECT AND CONSTRUCTOR.

WITH WHICH IS INCORPORATED THE "BRITISH ARCHITECT."

VOL. CXXII.—No. 4119. JANUARY 13, 1922

SMOKE AND ITS EVILS.

WE have recently given a résumé of the Smoke Abatement Committee's final report, and as any action on this report has yet to be taken it seems opportune to comment on the recommendations made and to attempt to summarise the position with regard to this important matter. We are beginning to forget the days of the coal strike, when London breathed purer air than it had enjoyed for many a decade, and the historical section of the report reminds us all too forcibly that previous efforts to effect improvements, extending over a century, have often failed to secure appropriate legislation. It is so easy when public opinion is roused to appoint a committee to investigate, during which investigation criticism must needs wait, and it seems equally easy after seemly delay has dulled the enthusiasm of the critic to take no action and allow matters again to sink into obscurity. We wonder how much careful and patient honorary work on committees has received such a reward, and while not attempting to prejudge what may happen in this particular instance, we suggest that it should be obligatory on Parliament or other bodies responsible for action on such reports to publish the reasons for rejecting any recommendations made.

Figures from the report (the form of representation is ours) tell us that in 1920–1921 every square mile of London received, on an average, a daily coating of more than 2,000 lb. of solid deposit from the atmosphere, being four times per unit area as much as a town such as Malvern. The offending smoke is classified in the report as that due to domestic and that due to industrial causes. Attention is at present concentrated upon domestic smoke, but though this is a right attitude we should guard against forgetting the industrial delinquent, and it is interesting to gather that industry, although kept in check by legislation not applied to domestic chimneys, is by no means free from blame in this matter. It appears to be very difficult to conduct successful proceedings against the industrial chimney, and the Committee complains of the inclusion of the word "black" in reference to smoke liable to legal action. It does not seem right that an offender should be able to escape owing to the technical difficulties of proving an offence due to phraseology, and we think greater powers of prosecution might be given having regard to modern methods of commercial combustion of coal.

A very valuable suggestion is thrown out that stokers should be taught the right use of fuel by means of technical classes. We are told that to a limited extent this is being done, but an extension of such teaching should result in greatly increased efficiency in the use of coal which would amply repay employers for any initial loss of services during tuition and immensely benefit the community. We would go further, and suggest that stokers attending such classes should be given a certificate and that it might be practicable to organise prizes in various industries for the greatest number of thermal units utilised on a given consumption of fuel. It appears that certain industries, such as mining, are exempt from the enactments applying to industrial smoke, and the Committee considers that exception should be very drastically reviewed. It is also recommended that the Minister of Health should have power to fix the standard of allowable smoke emission from time to time, and that while the power of taking proceedings may remain in the hands of local authorities, the power of enforcing the law should be transferred to the county authorities.

As regards domestic smoke the Committee has no epoch-making recommendations. It is recognised at the outset that no immediate legislation on the subject of the domestic grate is practicable, a conclusion with which most people will agree. The necessity for much further research on coal combustion is very strongly emphasised, and we hope that at a time when the Prime Minister is considering the Geddes' report, which includes almost every department in its scope, a clear distinction between real and false economy in productive investigations may be recognised. It is suggested that new housing schemes should not be approved unless specific provision is made in the plans for the adoption of smokeless methods for supplying heat. This recommendation, however laudable the object, if accepted, may in the present state of knowledge introduce great difficulties for the architect inasmuch as central heating alone for houses is by no means generally acceptable and no type of smokeless grate generally applicable has yet been devised. Had fuel researches started ten years earlier we might well have evolved a method of combustion which could have been fairly made compulsory in the new houses erected since the war, but so far as science is concerned it appears always to be our national policy not to look ahead but to wait until pressure of public opinion forces action which should have been previously taken. Of course, smokeless fuel is one promising line for the solution of the domestic-grate problem, but we fear we are a long way from any general economic supply of low-temperature carbonised coal for household purposes. For success, such material must be able to compete with raw coal in price and be amenable to the ordinary methods of open-grate burning. The latter requirement appears to have been achieved, but though a fusion of interests for the production of this fuel recently took place we are not aware that the matter has got very far beyond the operations of the Stock Exchange. The successful commercial preparation of this fuel seems to depend on the building up of suitable markets for the volatile products (gas and light oils) obtained by partial distillation, and this means heavy initial outlay in transmission services. This market must necessarily be in some measure in competition with existing gas companies, and the national requirements of smokeless fuel would mean the production of much more gas than is at present wanted, though there should be an enormous opening for really cheap gas.

An indirect partial solution lies in the reduction in the cost of gas and electricity. The charges for these are much too high and should really now be capable of quite appreciable reduction, which would react on the use of domestic coal, for in these days of difficult domestic service many households would turn to these methods of heating to a greater extent were the cost more reasonable. The Committee has a word to say about the practice sometimes adopted of charging excessively for gas and electricity in order to finance other public services.

There is no doubt whatever about the necessity for action. Not only are our national buildings suffering and involving heavy repair expenses, but all structures are suffering owing to smoke, and, what is more important, the health of the community is suffering severely. It is quite possible to give London the atmosphere of a country town, to add enormously to its hours of winter sunshine, and thus to provide a measure of health and cheerfulness unknown for generations. At present the cost of these amenities is too great, but the scientist and technician, given full scope, can, we feel convinced, solve the problem and translate the means into terms commercially practicable. Let the Government, therefore, encourage sound investigation and so far accept the Committee's recommendations that action may be rapidly taken when the difficulties are further elucidated.

NOTES.

The Price of Bricks.

AN interesting discussion on the cost of bricks took place at a meeting of the Colchester Town Council last week. The Town Council is carrying out its housing scheme by direct labour, and a proposal had been made that Fletton bricks should be purchased from a private firm at £3 10s. 2d. per thousand. The Housing Committee reported, however, that the purchase of bricks through the Department of Building Materials Supply was a condition under which the scheme was sanctioned, and that the Ministry of Health had intimated that its sanction would be withdrawn if the conditions were not complied with. It appears that the D.B.M.S. price is £4 10s. 10d. less 8s. 7d. per thousand, or 12s. 1d. in excess of the market price. It was pointed out that the figure of £680 per house at which the Colchester scheme was approved was exceptionally high, and was only sanctioned in order to permit the Council to purchase D.B.M.S. materials, but the action of the Ministry in compelling the ratepayers and taxpayers of Colchester "to help a Government Department out of a bad bargain" was strongly criticised before the purchase of D.B.M.S. bricks was agreed to. This case is an interesting commentary on the correspondence which appeared in our pages a few weeks ago.

Co-operation in Reducing Costs.

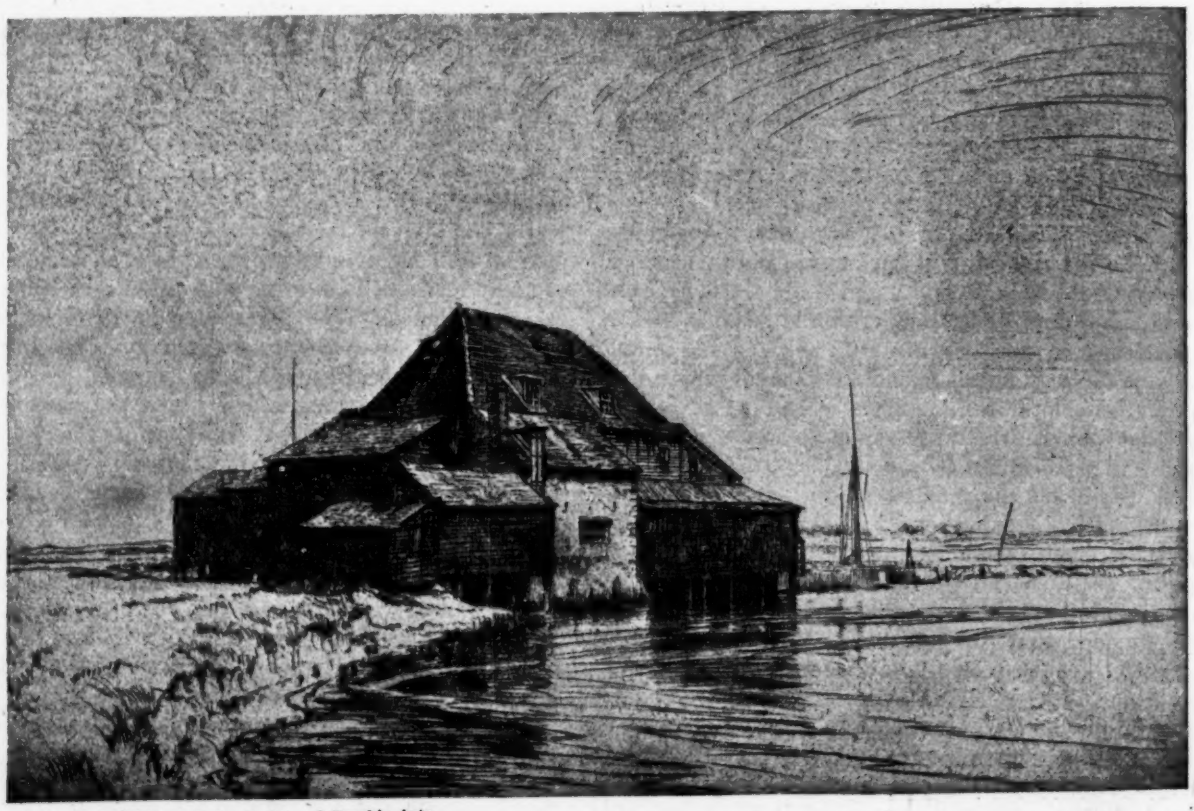
WE have received particulars of a case of interest to the building trade generally, showing as it does that there are operatives who are willing to co-operate to assist industry. A large house in the West-end in pre-war days was periodically painted and decorated, but when the owner inquired some two-and-a-half years ago what the cost of doing the work would be he found it would be 400 per cent. above what he had formerly paid. He declined to have the work carried out, but the matter was brought up again some fourteen months ago when the cost was 300 per cent. on pre-war prices, and he again refused to let the work proceed. A short time since the contractor who had always done the work received a deputation from his operatives asking if they could look over the house referred to with a view to putting in a price that would ensure the work being carried out. He agreed, and some of the men looked over the job, with the result that they came back and quoted an inclusive price that would cover their labour. He had then an estimate prepared on these lines, including materials, &c., with the result that he was able to quote an inclusive price for doing the job a little over 50 per cent. on pre-war cost. The owner of the house at once accepted the estimate, and the work went forward. These facts have an interest for all of us, and it is to be hoped that other operatives will co-operate in this way.

Fees to District Surveyors.

A CERTAIN amount of discussion has occurred lately between builders and district surveyors owing to the increased scale of fees introduced under the London County Council (General Powers) Act, 1921, passed in October last, for all work for which notice was given after that date. This Act, including the powers given to the Council under Sec. 26 (2) to increase the fees further—powers which have been exercised—increases the fees payable, including those under the by-laws, by 50 per cent. The Act also introduces an innovation that will be welcomed by all concerned with alterations to large buildings in giving, in Section 26 (4) (*a*), a table of "appropriate" or maximum fees based on the cost of the work and so abolishing the uncertainty of the abated fee customary under such circumstances. These maximum fees start with a fee of £1 1s. for work costing £25 or less, and rise at the rate of £1 1s. for each £25 up to £100 and £1 1s. for each £100 beyond that up to £500. An obligation is laid on the builder to furnish the district surveyor with the cost of the work within fourteen days of its completion.

The Hartlepool Disaster and Town-Planning.

THE Town-Planning Institute has passed a resolution pointing out the important lesson which is conveyed by the disaster at West Hartlepool. The resolution states: "In most if not all industrial towns, timber yards and factories (many of them being hazardous fire risks) are intermingled with valuable business premises and residences. Apart from the prohibition of obnoxious industries there are only a few towns that have plans and regulations in force to prevent the evils arising from haphazard development. The preparation of comprehensive plans in which the height, bulk, and character of buildings and the distribution of industries could be dealt with in the interests of industrial efficiency, safety, and convenience is becoming



From the Exhibition of the Society of Graphic Arts.

The Old Tide-Mill, Walton-on-the-Naze. From an Etching by MR. FRANK L. EMANUEL. (*See p.* 74.)

of greatly increased importance as towns grow larger and more concentrated and motor transport develops." The Institute urges the importance of plans being prepared to help in preventing such disasters in future, and we hope these representations will not be lost sight of.

Art in Public Life. On a recent occasion, in the course of an important speech on art in public life, Mr. H. A. L. Fisher said: "It is to our public bodies that we must now look for the big spending, not to the great landowners," so curiously illustrating what we have been at some pains to urge in these columns. This new and important responsibility of municipalities towards art which so much concerns the common welfare cannot with certainty of satisfaction be delegated to others. Their dependence on outside and expert advice is often found to result in failure, and the counsel of perfection would be for them to regard their own obligations and fit themselves to exercise a sound judgment of their own. Of course, the question at once arises whether the class of men who are elected to our municipalities are likely to be capable of such judgment and decision. There is no security in a dependence which is the result of ignorance, and which includes in it a lack of proper civic responsibility. Mr. Fisher also pointed out that "the education of our public bodies . . . is still far from complete," and no doubt this is a difficulty; but there is another side to it—in a respect of persons, and "waiting on great names," which has been a disquieting feature. The official has become far too prone to assume a sort of mystery for art which is not felt by artists themselves, who perhaps are nearer to the facts.

The Cost of Beauty. On the question of cost, Mr. Fisher had also something very pertinent to say—"There was no reason to suppose that beauty was more costly than ugliness." This is no doubt the case. Is not ugliness probably the more costly of the two, being the expression of a vulgar outlook, which is generally to be associated with extravagant expenditure? Much too much money has often been paid for pictures in the past. The exhibition type of the "'eighties" and onwards was artificially inflated in value. As Mr. Fisher said: "It was ostentation in scale and ornament which was expensive," and, we may add, vicious as well. We may, however, demur, though accepting the spirit of his remark, to his further statement that "the unobtrusive perfections of line and symmetry could often be purchased for a song." Though probably the case, it is so only because the good work of the more endowed artist is at a discount at such a time, and has, in the words of Shakespeare, to beg "for leave to do it good." The best work has no doubt often been done for nothing, since so few distinguish, amid the pressure of the less endowed, the work which is better than mere craftsmanship, and transcends method. But the sum of the matter rests in the hope that "the honest and laborious citizens of this country," as Mr. Fisher calls them, will take the matter to heart, and through a better acquaintance with the nature of art, of its important and ennobling relation to life, fit themselves to exercise a wise judgment when dealing with the matter.

The Choir, Norwich Cathedral.
From an etching at the Exhibition of the Society of Graphic Art, by MR. J. A. BREWER. (*See p* 74.)

Old London Bridge. The discovery of a considerable portion of Old London Bridge attracted widespread interest, and suggestions have been made for its preservation. It seems unlikely, however, that the removal of any portion of this unique link with the past to a place of safety will be effected, neither is it probable that the proposal to leave it *in situ* will be carried out. Unfortunately, it is a question of expense. London can ill-afford to lose sight of this 700-year-old fragment of the famous bridge which bears a history unsurpassed by any other of the City's possessions. We understand it is only a matter of days before the "obstruction" will be removed, and as there must be many who have not yet seen the arches and would like to do so we have obtained permission from the architects, Sir John Burnet & Partners, for parties to inspect it on Tuesday next, January 17. Any of our readers who would care to join should be at the place of meeting, viz., the entrance by the Church of St. Magnus the Martyr, between the hours of 12 noon and 2 p.m. On page 68 will be found a diagram of the Bridge based on a drawing by E. L. Cooke. Copies of the diagram will be presented to those who visit the remains on Tuesday on mentioning *The Builder*.

GENERAL NEWS.

Professional Announcements.

Mr. H. J. Venning, F.S.I., has removed to No. 5, Bedford-row, W.C.1. (Telephone: Chancery, 7431.)

Mr. P. J. Westwood, A.R.I.B.A., of 7, Adam-street, Adelphi, W.C.2, has taken into partnership Mr. J. Emberton, A.R.I.B.A. The practice will be carried on at the same address as P. J. Westwood & Emberton (Telephone, Gerrard 717).

An Architect's Estate.

The late Mr. John Wreghitt Connon, F.R.I.B.A., of Bardsey and Liverpool, left estate valued at £4,791.

The British Empire Exhibition.

As sufficient guarantees of the minimum of £1,000,000 have been secured, the work of clearing the site for the British Empire Exhibition at Wembley has commenced.

A Surveyor's Estate.

The late Mr. Frederick Fowler, of Sheffield, a member of the Surveyors' Institution since 1868, and treasurer of the Sheffield Society of Architects and Surveyors from 1893-1911, who died on September 23 last, aged 89 years, left property of the gross value of £48,484, with net personalty £44,353.

The Society of Antiquaries.

The following have been elected Fellows of the Society of Antiquaries:—Sir William Lawrence, Bart., Sir William H. Wells, and Messrs. Athelstan Riley, A. J. Toppin, L. H. Dudley Buxton, Legh Tolson, James Durham, R. E. Mortimer Wheeler, H. G. W. d'Almaine, F. C. Wellstood, J. W. Bloc, and H. J. E. Peake.

Greater London.

The Finsbury Borough Council last week passed a resolution disapproving of the London County Council proposals to absorb the municipal control of Greater London in one central authority, and expressing the opinion that the London County Council now possessed greater powers than it could conveniently administer.

The Victoria and Albert Museum.

The British Institute of Industrial Art is opening an Exhibition of Present-Day Industrial Art, to be held, with the sanction of the President of the Board of Education, in the North Court of the Victoria and Albert Museum, from January 16 to February 25, inclusive. The endeavour of the organisers is to bring to the notice of the public the latest productions of both manufacturers and craftsmen. The exhibits consist of textiles, metalwork, ceramics, printing and allied industries, and furniture. It is felt that this opportunity of inspecting British artistic products of to-day, in the midst of the National collection of examples of industrial art of the past, will afford new opportunities to manufacturers, designers, and the public. On the termination of this exhibition, the collections will be sent to Bradford, Birmingham, and other centres. Admission is free.

Roman London.

While excavating in Gracechurch-street, E.C., for the purpose of laying a telephone cable, pieces of Roman walling and red tesseræ pavement have been discovered. The wall has been cleared for a distance of 10 ft. along the centre of Gracechurch-street, and this portion is 2 ft. 9 in. thick; a wall at right angles to this, 4 ft. 6 in. thick, has also been unearthed, but owing to the narrowness of the trench cannot be traced for its full length. The face of the wall is covered with plaster and painted, the back being of ragstone and Roman burnt-clay bonding till of a bright red colour. It is assumed that the remains are of a building connected with the Roman Forum which the late Sir Lawrence Gomme considered to have occupied a site near the present Leadenhall Market. It has been found impossible to remove the plaster of the wall, but the tesseræ will be removed before the trench is filled in.

COMPETITION NEWS.

Harrogate.

Mr. Walter Cave, F.R.I.B.A., the assessor, has placed the designs in the Harrogate war memorial competition as follows:—(1) Messrs. Pretawick & Sons, Lee, Lancashire; (2) Mr. G. B. Howcroft, A.R.I.B.A., Upper Mill, Lancashire; (3) Mr. Norman Culley, F.R.I.B.A., Huddersfield.

Peru.

The city of Trujillo, Peru, invites designs for a monument representing "Liberty," to be erected in the city square in celebration of the centenary of the independence of Peru. The conditions state: "The artist must find his inspiration in the fact . . . that Peru wrenched herself from Spanish domination in 1821." The premium offered is £1,000, and artists of all countries are invited to compete. Sending-in date, April 25 (60 days extra for entries from abroad). A copy of the conditions may be seen at *The Builder* office, or may be obtained from the Consul-General of Peru, 36-37, Queen-street, E.C.2.

Auckland.

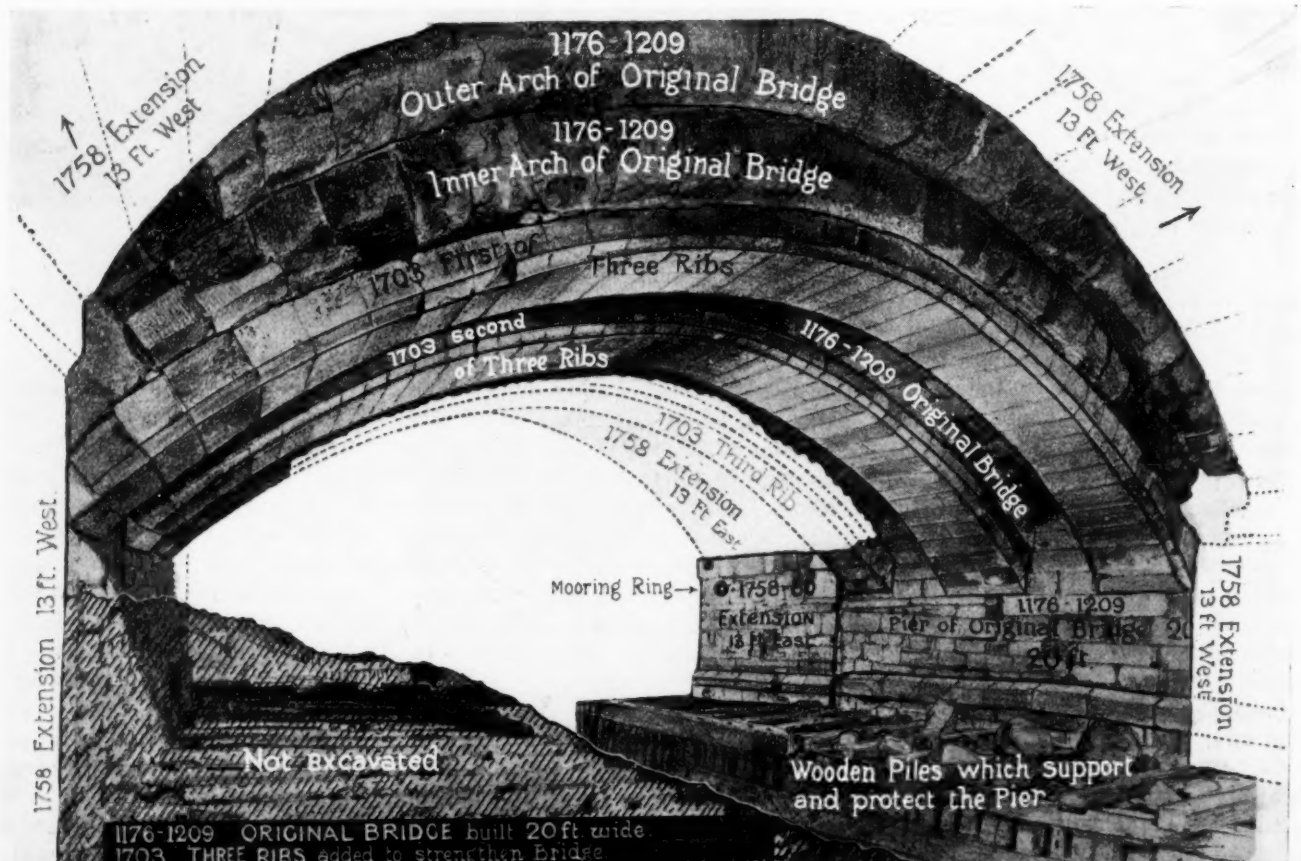
The R.I.B.A. has received a cablegram from the Mayor of Auckland advising competitors in the Auckland War Memorial competition that answers to numerous questions raised are now in the mail, and are due in London at the end of the present month.

Hull.

The Property Committee of the Hull Corporation has decided to promote a competition for an art gallery, to be erected on the south side of the City-square.

Other Competitions.

Other competitions still open include: Seaford lay-out (Sending in date, Jan. 23); Truro memorial (Jan. 21) (banned by R.I.B.A. and Society of Architects); Kirkcaldy memorial; Dundee (April 30).


1176-1209
Outer Arch of Original Bridge
1176-1209
Inner Arch of Original Bridge
1758 Extension
13 Ft. West
1758 Extension
13 Ft West
1703 First of Three Ribs
1703 Second of Three Ribs
1176-1209 Original Bridge
1703 Third Rib
1758 Extension
13 Ft East
Mooring Ring
1758-60 Extension 13 Ft East
1176-1209 Pier of Original Bridge 20 ft
1758 Extension 13 ft West
1758 Extension 13 ft. West
Not Excavated
Wooden Piles which support and protect the Pier
1176-1209 ORIGINAL BRIDGE built 20 ft wide
1703 THREE RIBS added to strengthen Bridge
1758-60 EXTENSIONS built 13 ft West & 13 ft. East making total width 46 ft

Arch of Old London Bridge now Exposed. Based on a drawing by T. L. COOKE. (*See p.* 67).

CORRESPONDENCE.

Hospital Design.

SIR,—In the review of the Watford Competition in your issue for December 23, I notice certain comments on the principle of planning sanitary annexes, which I feel should not pass without notice. It will be a surprise to hear the detached sanitary tower spoken of as "antiquated." Still more to hear that these towers "block sunlight and prevent circulation (I suppose of air) to a considerable extent."

Your reviewer notes that attempts have been made in the direction of dispensing with them, and gives a case which he himself says "had rather unfortunate results." I can well believe it. I should have thought if we went back beyond 30 years we could find dozens of such cases of planning with similar results. It was the prevailing custom. The sanitary tower is the modern and up-to-date advance introduced in later years on the advice and authority of the most eminent sanitarians of the day—medical, engineering, and architectural—including Sir Douglas Galton. The "antiquated" is not the sanitary tower, but the system your reviewer advocates and illustrates.

I remember going over a new large hospital in Bavaria nearly twenty years ago, where the closets had been put within the main building. The comments of the Medical Superintendent were very condemnatory, and he added that the architect was responsible and he (the doctor) had to put up with it. Economy in hospital design is important, but not at the expense of the staff and patients. The economy should be effected in other ways.

EDWIN T. HALL, F.R.I.B.A., F.R.San.I.

[*** The particular point raised by Mr. Hall is without question a most important one, but upon which many authorities diverge. Is it Mr. Hall's opinion that the detached sanitary annexe must be accepted as the final arrangement—and that there can be no further evolution in this respect? No particular type of hospital plan can be adopted as final; scientific hospital construction is a living thing, and must move steadily forward in its development. To quote Sir Douglas Galton: "Fortunately the tendency of the modern hospital architect is not to be content to accept the dicta of his predecessor but to endeavour always to improve upon former practice, and a great development in new methods of hospital construction has been the result." Mr. Hall has designed many important hospitals, and is therefore entitled to speak with authority on matters such as these; it is well, therefore, to consider carefully what he says. But when he writes of "the sanitary tower being a modern and up-to-date advance introduced in later years" he is referring to a plan instituted over half-a-century ago. Surely then we must welcome the progressive step, attempted by the successful competitor under review, to abolish the projecting sanitary annexe, provided that a successful result can be obtained. Such was the spirit of our criticism. It is an undeniable fact that with annexes projecting at the southern ends of the ward the patients' beds are deprived of a considerable amount of sunshine and air movement, and in such a position they must be considered antiquated. We agree with Mr. Hall in this, that unless adequate and effective means are taken to provide a clear cut-off and ventilated lobby there would be objections to the sink-room and water-closets being brought into the main body of the ward block.—ED.]

Abandoned Housing Schemes.

SIR,—Mr. Kennard's letter does not make the facts clear. The letter of protest that he refers to came long after the meeting of November 28 had been held and the resolution taken. As far as I know no protest was raised at the time of the meeting. At the subsequent meeting on December 22, Mr. Kennard asked for the number present to be counted, but this was not until after the ballot had been taken. For continuing the meeting after the ballot thirty members only were required to be present, and there were more than that number.

The custom, as far as my memory extends, has been for business to be carried on unless the number present is actually counted and found to be deficient, and this custom has the support of the practice followed in the House of Commons. If the numbers quoted in the letter are taken from the Attendance Book they are not necessarily reliable; it commonly happens that some members do not sign the book—indeed, I have to confess that I did not sign it myself.

An action on the question of payment for abandoned schemes fought in the courts to a successful conclusion might help some of our members, but the various cases differ very much in their conditions, and I am afraid that a single decision might leave a great many of them almost untouched. Personally, I believe that the utmost the courts would give would be fair payment for work actually done by the architect irrespective of compensation for the fact of a scheme being abandoned. Judges have an awkward way of interpreting conditions of remuneration in the light of their own feeling of what is fair and reasonable.

I must also remind your correspondent that at the two special meetings at which interested architects freely discussed the best course to take, he put forward his proposal and could get practically no support. The action now being taken is the result of free discussion and unfettered decision by the great majority of interested architects who attended the meetings.

I think most of our members will agree that it will be well to see what we can get from the Ministry before going to the courts.

ARTHUR KEEN, *Hon Sec., R.I.B.A.*

Modernism and Design.

SIR,—Many architects, like myself, must have been interested in Professor Lethaby's illuminating article in *The Builder* for December 2. The Professor has the faculty of stirring thought and rising above the academic and conventional. Not content with superficialities, he is habitually digging down to bedrock principles of design.

Architecture is a spirit, *i.e.*, it is more than mere formalism or repetition or a purely technical subject. It is a refined mental quality added to construction, and has its laws. Much building, however structurally good and strong, does not necessarily embody this individual quality or character. Tradition is valuable, and we are favoured in the London streets, where it is writ large for our edification. We are without excuse, therefore, who have no time or opportunity for book-study or travel, with this panorama of monuments, incorporating the thought of the ages, continually exhibited to us. We have to learn from this tradition how much to discard as well as what to perpetuate. The need in learning is the cultivating of the faculty of discrimination between the false and the true. The true is usually overlaid with much error, and the winnowing process is difficult. Tradition is building experience to date, and it is not fitting to select a few fanciful examples or styles and ignore the rest. London should be studied as a whole from one end to the other, and the lesson of its principles or want of principles in design considered comprehensively.

The architect occupies a unique and highly-privileged and responsible position, and can rightly influence clients and the public in high and noble feeling if he is prepared to promote the best of his art. His work remains permanent in brick or stone for good or ill

Many pregnant and important questions arise out of the consideration of what is true architecture. Does it consist of purely utilitarian or scientific construction? Does beauty arise automatically out of purely serviceable building? Is the beauty of a tree in its structure, or is it a quality apart? What is the reason for the intoxicating beauty of the dome of St. Paul's Cathedral? In the writer's estimation, this dome, seen from a 'bus on Waterloo Bridge in the evening time towards sunset, is the finest thing in London. Why is it so? What are the laws of beauty?

Architecture in time past has been largely individualistic. Is not that time visibly passing? The thought and conditions of the time are towards democracy in every department, and the opinion of the lay mind is more than ever permeating our councils. Modern education and conditions render this inevitable. Closer international relations and ideas are transcending purely national ones, and the increasing use of foreign materials in building and the greater output of scientific manufacture are leading to more composite building and design. New, patent, scientific, composite materials tend to dictate the design to the traditional architect, and even to supersede his services. Further increased attention to the subject of hygiene will evolve or dictate new design. Preventative means rather than curative are becoming factors in social health, and greater co-operation and harmony with natural laws are impelling new forces in housing design.

The public mind in modern times, greatly stimulated by the war, has expanded permanently, and will demand expression in social conditions. It will no longer serve to design houses and towns with more or less suggestions of hygiene and spaciousness: the public will demand the real thing. A greater opportunity has scarcely presented itself than in recent times, when architects having one ideal and spirit could have combined to great effect really to influence and assist the renaissance. The healthful forces released will inevitably aid and expedite true building, but whether the profession will come out with credit and increased prestige is not at all clear at the present time.

True principles of design are eternal. True building in the past contained the seeds of prophecy of the future ideal city. Traditionalism and futurity are one in essence. To build simply for the time is neither good architecture nor economy.

WILLIAM E. SANDERS.

Unification and Registration.

SIR,—In reply to the letter from Mr. Arthur Keen that appeared in the last issue of your Journal, we beg to remind him that no amount of sophistry can alter facts, and that, at the moment, we are not dealing with the Report of the Sub-Committee to which he refers, with which, according to his own showing, the resolution of the Council is at variance. We agree with Mr. Keen that the first of the resolutions passed by the Unification and Registration Committee, and subsequently adopted by the Council of the R.I.B.A., defines the scheme in the following words: "That the principle of Scheme 'A,' namely, the bringing of all the architects of the United Kingdom into membership of the R.I.B.A., be adopted as the basis for unification." Not only is there no suggestion of any test or qualification in the above resolution, but, in addition, the introduction of the word "all" provides for the admission to the R.I.B.A. of every individual member of the profession in the United Kingdom who desires to enter.

Finally, if, as Mr. Keen insists, the above resolution of the Council does not mean what it says, then it is the duty of that body to make its policy clear to outside members of the Institute. But until this is done it is equally the duty of those interested in the welfare of the R.I.B.A. to point out the dangers and difficulties it will have to face consequent upon the action of its governing body in supporting and adopting the present anomalous and mischievous proposal.

GEORGE HUBBARD.
ALFRED W. S. CROSS.

Sink and Lavatory Basin Traps.

SIR,—I noticed in your issue for December 30 an inquiry as to the omission of plumber's traps to sinks, &c., where the length of pipe is small. I have found that, however short the pipe from the waste to the discharge outlet may be, if the trap is omitted in certain states of the weather it will form a draught through the pipe into the house, and if it is over a gulley outside it will bring the smell into the house.

H. DIGHTON PEARSON.

THE ARCHITECTURAL ASSOCIATION.

WHAT WE CAN LEARN FROM POST-RENAISSANCE ARCHITECTURE.

WE give below a résumé of the remainder of the paper read before the Architectural Association on January 2 by Mr. H. S. GOODHART RENDEL, the first part of which was reported in our last issue:—

Continuing his remarks on the use of the orders, he said Sir William Chambers, alone of all those would-be Vitruviuses, composed a set of orders which need fear nothing in comparison with the accepted Italian examples. Of the orders according to Sir William Chambers, it might indeed be said that they would serve as a standard for the student just as well as—and no better than—the orders according to Palladio. The Georgians unanimously rejected the peculiarities of Vignola, who differed from all his rivals in several particulars, chief among which was his assigning to the entablature one-fifth of the total height of the order, whatever the order might be. This proportion was much greater than that allowed by Palladio and the rest to the entablatures of the lighter orders. If it were adopted it would strongly affect the aspect of the building which the order adorned, giving to it a general appearance of gravity and making wide intercolumniations disagreeable to the eye. If Vignola's proportions were taken as normal, very different effects would be obtained from those produced by Jones, Wren, or Chambers.

The orders in some established form were the basis of neo-Classical design. He would not suggest that they should be standardised and never varied, but he did think it necessary that their normal types should be recognised, if only as a point of departure for skilful variation. When once the regular procession of architecture had been checked it was no longer possible to do as the Greeks did in making each new building a modified reproduction of some building nearly as new. When once an artist, from discontent with the art of his own time, had harked back to that which his predecessors had discarded he had squandered his inheritance and had nothing to bequeath to his successors but his discontent. Nothing, thereafter, could be unquestioned; laws must be made and discipline kept. Laws, however, might be liberally interpreted; in spite of Vitruvius, there was still work for the designer in ancient Rome, and even if one must still be a Vitruvian there was work for designers to-day.

In the past century, when the mediævalist attack upon post-Renaissance architecture was at its fiercest, it was constantly asserted that Anglo-Palladian buildings were ill-suited to a northern climate. That, he thought, had proved to be true as often as not. In the town of Bath, there was scarcely a window which had not had its architrave splayed away externally at some time or other in order that the rooms within might have a little more light. Before the innovations of Adam and his school it generally happened that the finer a house was without the darker it was within.

The other things for which he found fault with the Anglo-Palladians were things of which their French contemporaries were comparatively guiltless. Why were English interiors darker than French ones? Was not Palladio again at the root of the trouble? The French windows were large and closely set, bordered with narrow architraves—the Italian and the English were small, widely-spaced, and frequently framed in expansive and elaborate dressings. The superposition of ranges of windows nearly equal in size, which was so abhorrent to the Anglo-Palladian, seemed never to have been objected to by the French, if it was called for by convenience. Such a case they usually met by the employment of two superposed orders, with what triumphant success that world's classic the Chateau de Maisons, would witness. The horizontal division of an elevation into two seemed not to have been popular in England except when the building was really only one story inside, like the Banqueting House, St Paul's Cathedral, or the church of St. Mary-le-Strand!

In his opinion, Inigo Jones did not teach his countrymen to profit by the Renaissance so well as Philibert de l'Orme did his. The Palladian hypothesis was a hard one to accept, and without its acceptance a great deal of English neo-Classical design must be distasteful. He thought it was in the study of the work of Wren, Vanbrugh, and Hawksmoor that the greatest profit the English eighteenth century could afford us might be found.

Speaking on the design of churches, he said he supposed St. Paul's Cathedral was one of the most curious buildings in the world. It was a cathedral with a nave, aisles and clerestory, put inside a curtain-wall of imaginary two-storied architecture. The upper story of the side elevations, being a sham with nothing behind it, could have no windows except the little ones in the pedestals of the niches, which windows lighted the spaces between the vaults and the roofs of the aisles. Scarcely so extraordinary, but still very peculiar, was the treatment of the central space beneath the dome. That was octagonal on plan, and displayed eight great arches whose haunches at their springing were so close to one another that their bearing could be received by a single pilaster of the internal order. Such a pilaster would, of course, be absolutely inadequate to support the dome. Therefore, each of the canted arches was blocked for a certain distance on either side with what was treated architecturally as mere filling up, but what must in reality be the main body of the great piers upon which the dome rested. There were, then, in the very essence of the design of St. Paul's Cathedral two instances of wanton irrationality, of which neither was justified by its result. The wrong-headed ingenuity with which Wren had packed one kind of building into the skin of another and refused expression to the main supports of his magnificent dome was characteristic of his method of design.

In the design of the city churches, which Wren rebuilt on sites of every conceivable kind and degree of inconvenience, there was every opportunity for cleverness, and of each opportunity he was worthy. Never did architect accept so loyally the conditions imposed upon him by his programme. As a result of that, few of his churches were absolutely very good, but all of them were marvellously good considering the difficulties under which he worked. It had long been the custom especially to praise the interior of St. Stephen's, Walbrook, as being one of his happiest designs. One of his most characteristic it certainly was, since nobody but Wren would have tried to cover an oblong floor with a cruciform arrangement of dome and vaults. The result of that attempt was surprisingly pleasing, but disfigured, as it was bound to be, by the lack of harmony between the upper and lower parts of the design. The dome, which was the climax of the interior, rose from eight columns precisely similar to all others in the church; those portions of the side walls which pretended to be the end walls of the transepts were not delimited in any way from those portions which belonged to the aisles; the whole thing was obviously a mere piece of stage-scenery. As such it had considerable beauty, but as an example of reasonable architecture it could scarcely be accepted. Wren's church of St. Mary-at-Hill must have exhibited a more justifiable if less ambitious expedient for turning a square into a cross. The church was a thing of the past, but from Savage's building one could learn that Wren here made a square room cruciform by means of four columns placed at the internal angles of the cross. The arms of the cross had semicircular barrel-vaults, the corner compartments had flat ceilings, and the central space was covered by a dome on pendentives. Nothing could be better in its way than that simple disposition, and the design, whether chiefly creditable to Wren or to Savage, was worthy of careful study.

Later, Wren tried another experiment with a dome, in the church of St. Swithin, Cannon-street. Here the church was square and the entablature of an order of engaged columns was carried diagonally across the corners of the building so as to receive the octagonal dome, although one of the columns stood free between the body of the church and a short irregular aisle. That, however, was accidental to the design, which, moreover, was a bad one at best. A dome, even when constructed of wood and plaster, should be so designed that it would stand if it were of masonry. To make a sham dome which, if it were real, must fall, was about as reasonable as it would be to make a large, flat ceiling of imitation granite. The domical form had no significance in carpentry, therefore the woodenness of a sham dome should be concealed. At St. Swithin's the long flying entablatures across the corners of the church could be nothing but wood or iron, and were therefore unsuited to support a dome. Those churches with cupola roofs represented, in his opinion, Wren's most instructive contribution towards the resources of Protestant architecture, in which the first essential was that all should see and hear the preacher, and were worthy of study in the highest degree.

After discussing churches by Hawksmoor, Gibbs, Hardwick, and Archer, he said since mediæval times the design of great buildings had not been the English architects' *forte*—he had had little opportunity of building them and he never overcame the disadvantages of inexperience. It was rather, he thought, in the design of buildings comparatively humble, and in the use of comparatively humble materials, that the modern architect could learn most from the practice of his seventeenth- and eighteenth-century predecessors. Vanbrugh's palaces might teach him, in the words of Reynolds' praise, "to compose like a painter," but there was little for him to learn from the palatial designs by Vanbrugh's contemporaries.

In conclusion, he said let them beware they did not study the beautiful smaller houses of the neo-Classic period in a sentimental spirit, but wrest from them what they had to teach in form and arrangement. In arrangement of plan perhaps they could not teach very much, since modern demands for convenience and economy had greatly altered the practice of house planning since the days of the Georges. They might, however, note as national peculiarities worth preserving the general avoidance in the old plans of internal courts, of doorways placed centrally in the walls of rooms, and of buildings only one room thick.

In the design of elevations they might remark, perhaps with less appreciation, the frequency of an order embracing two stories and the general rejection of small orders superposed. Temple porticos on a grand scale they should, he imagined, only observe to avoid. They would turn from country houses with basements to those in which the offices were on a level with the sitting-rooms. He hoped they would attend particularly to those designs in which the chimneys were treated as ornaments rather than as discreditable secrets, and he predicted that in general they would find Jones' and Wren's skill in proclaiming the roof more suggestive than Chambers' or Adam's ingenuity in concealing it. In short, they would be wise in trying to winnow the grain of indigenous neo-Classicism from the chaff of Palladianism. Doing that, he thought they would find the early and the late divisions of the period under discussion more useful than the style of the middle years. The genial work of Jones, Webb, and Wren, and the grandeur of the style of Hawksmoor and Vanbrugh on the one hand, and the modest and graceful design of Gandon, Adam, and Wyatt on the other, were both in their different kinds very instructive. The designers who worked in the years between those two groups suffered generally from a formalism for which there was to-day neither justification nor demand. In his view the curse of England had been Palladianism, and he hoped that Whitehall, which saw its birth in the Banqueting House, had seen its death in the Local Government Offices.

THE ROYAL ACADEMY WINTER EXHIBITION.

IT would indeed be an exceptionally striking Royal Academy exhibition which would show for the first time all that is now exhibited in the Winter Exhibition. We have sometimes found that a representative collection of the works of a deceased artist gave an added security to his reputation, but when we get a large number of the best works of some thirty-six deceased artists we necessarily get a pretty high standard throughout, and an exhibition of quite unusual interest.

Though an exhibition of works by deceased members of the Academy may not sound too attractive, we imagine that the well-selected examples which form this Winter Exhibition will prove singularly interesting and attractive. For our part we feel that a collection showing so much of the best fruits of the many years' toil of our modern painters is one deserving close study and commanding much admiration.

It is the mission of critics to be critical, but we should not envy one who could pass in review the works of these thirty-six dead artists unmoved and without gratitude for that vision of beauty in the world which they have transmitted to us. What if some of Herkomer's portraits appear dull and affected; if sentiment is carried to a point of poignancy in Bramly's beautiful painting of "The Hopeless Dawn"; if Graham's Scotch landscapes appear theatrical and wanting in dignity; if Rivière's animals and Waterhouse's mystic ladies do not quite touch us in the way we would like—what does it all amount to? We waste our time in trying to appraise too closely and comparatively the pictures which are painted by sincere artists when we should rather be encouraging to our utmost the artistic vision in this world of dull commercialism.

Some of the artists are represented by over a score of works; the total number, 433, gives an average of a dozen to each artist. Thus most of them are more adequately represented than they have ever been in any one exhibition. The exhibition is probably strongest in landscapes, many of which are of striking quality. We see now something of the quality which Sir Alfred East produced; some of his are as noble and spacious as anything we can show in recent years, and he had acquired a striking capacity for the grouping of trees in a fine balance of effect. His colour was also good and never thin and cold; his standard of quality showed no falling off before he died. In landscapes, nothing finer of its sort has been done than "A Midsummer Night" (75), the diploma work of H. W. B. Davis, and there are two or three Napier Hemy's which are long likely to be unsurpassed of their kind. Sir Ernest Waterlow, Alfred Parsons and Edward Stott are also amongst the notable landscape exponents. The "Changing Pastures" (94) and "Folding Time" (202) are amongst the gems of the collection. It seems a pity that the fine decorative landscape by Sir W. B. Richmond, "Near Via Reggio" (223), could not be translated into lasting material such as wood inlay; it is a splendid piece of deep, rich colour. The force, depth and richness of his "Death of Ulysses" (88) make it worthy of a permanent setting.

There are not many exhibits of sculpture, but they include some of the best work by Harry Bates, and amongst these one of our best equestrian monuments, that commemorating Lord Roberts in India. Some able accomplishment is to be seen in the models by Briton Rivière, H. W. B. Davis, and several good examples of the refined art of Onslow Ford are also shown, including his beautiful little figure "Snowdrift."

The thirty-one drawings which represent the work of four deceased architect members of the Academy are all nice, refined and adequate illustrations, but the present generation can hardly realise the vivid and keen interest which the first appearance of these drawings aroused, and how Norman Shaw's designs seemed to mark a freshness and vigour of treatment which came at a period when it was peculiarly welcome. We all felt that here was an artist who understood something of the spirit of our old domestic architecture and who made it live again in a restrained and pleasing way. Two of these drawings, at least, were made by Shaw—(384) "New Zealand Chambers," and (403) "Pierrepoint, Surrey." One of the best is by Professor Lethaby (378), "The Fireplace, Cragside," and another good one, of Scotland Yard, is by Gerald Horsley. The Alliance Assurance Buildings in St. James's Street, the New Zealand Chambers, and Scotland Yard showed that Shaw could meet the problems of modern street architecture in a fresh and interesting way. These buildings still rise far above the average by reason of their good proportions and pleasing emphasis of parts. It is seldom nowadays that a new building creates so much real interest as did these at the time they were erected. Those who are inclined to argue that the Gothic revival was futile may look at the drawings by Bodley in this exhibition and remember that these and scores of beautifully executed works give the lie to it. Belcher's Institute of Chartered Accountants, his South Kensington Museum, his Colchester Town Hall, and the Ashton Memorial are the outcome of an exceptional ability which never had the fullest opportunities for expression. Alfred Waterhouse is represented by one of his best works, the National Liberal Club. But the few illustrations on these walls suggest, only to the few who know, how much they represent of excellent modern building and its great influence.

The Architectural Association.

The following donations to the Endowment Fund of the Architectural Association have been received since November 28, 1921:—Mr. W. Curtis Green, £10; the Massachusetts Institute of Technology (Department of Architecture), £25 3s. Mr. W. Curtis Green has subscribed £200 to the Debenture Issue.

Additions to "Commonwood" House, Chipperfield. MESSRS. BENNETT & HOSSACK, AA.R.I.B.A., Architects. (*See p.* 75.)

THE SURVEYORS' INSTITUTION.

THE DEVELOPMENT OF LONDON.

In the course of a paper read at the Surveyors' Institution on Monday last, entitled "The Problems of Greater London," Mr. W. R. DAVIDGE, F.R.I.B.A., said the problems of providing for and maintaining so huge and widespread a population as was contained within Greater London might perhaps be best summarised under the heads of the essentials of existence:—(1) Transport, (2) feeding and maintaining, (3) health and safety, (4) education, and (5) local and central administration—rating and finance; and he dealt with each of these questions separately.

TRANSPORT.—The main problem, so far as it concerned the average Londoner, was how to find and keep a decent home together. In ninety-nine cases out of a hundred he must journey to London daily, or, at any rate, was dependent upon London for his work, so that even the locality of his home was dictated by the transport facilities available. In certain directions the time had been greatly reduced by the electrification or other speeding-up of the means of transit. Immediately a line became popular the effects of overcrowding became apparent. Traffic congestion and strap-hanging were most in evidence where the transport facilities afforded the greatest attraction. The facilities for quicker travel had much increased, but had nothing like kept up with the increased number of people who now travelled to and from London daily. The railway companies were electrifying their services, but more people had to stand up. Even the tubes, our fastest means of conveyance, had so many stops that the average over-all speed could not be much more than 18 miles an hour. The whole transit system in Greater London required to be overhauled and improved. An entirely new plan was necessary; new railways, new express tube services, street widenings, quicker trams, and non-stop omnibuses were wanted. At present many of the suburban trains and all the tubes were trying to do duty as omnibuses, stopping practically everywhere where there was a chance of picking up traffic. If the new central authority was to have any real power to improve London it must start by controlling all means of traffic. There were nearly 670 miles of railway and some 628 passenger stations in Greater London—almost sufficient, one would think, if properly used. Railways must be used as railways and not attempt to stop every half-mile or mile. The tube railways of London had been planned with stations at every important point, and it became impossible to get really rapid transit under these conditions. If that were to be done, either a large number of stations must be closed or, preferably, another "express" tube driven underneath with stations not oftener than every five miles. The heavy cost of tube railways—about £600,000 a mile—was almost entirely due to the cost of the stations, which were responsible for three-fourths of the cost. If the stations were kept five miles apart a railway of double the length could be constructed at half the price and provide really rapid transit to the outskirts. Great extensions of the tubes and underground railways would have to be made in all directions. In the south-eastern section of London not a single tube had yet been constructed, and there was a big field for new construction. Government control was insufficient, and the new central authority, which represented Londoners, must somewhere have a thinking department which would look ahead and provide for future needs.

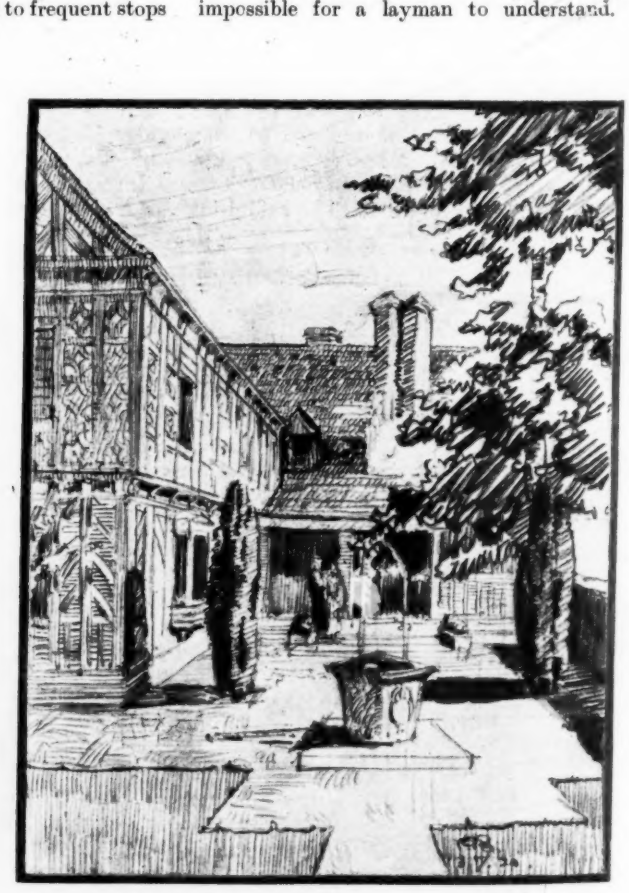
The main functions of the omnibuses should be to take short-distance passengers and act as feeders to the railway systems, although in the outlying districts, where traffic was light, a frequent service of buses or trams was of the utmost value in opening up a district for development. The great advantage of the motor-bus was its "flexibility," which rendered it largely independent of other vehicles and also enabled routes to be changed at any time. Trams, with their large holding capacity, conveyed a vast number of passengers, but nothing like full use was obtained from them owing to frequent stops and traffic blocks. In the outskirts especially the tramways might well become light railways, running on special tracks—not necessarily alongside roads. This presented a difficulty; if the new central authority was to regulate all traffic in Greater London it obviously should not itself be a competitor—it must either own all or none, but control it must have.

The main roads of London were much the same as they were eighty years ago; in fact, in many places they had been narrowed by encroachments. A new main road system would have to be designed and the present roads improved whenever opportunity offered. Building lines must be laid down so as to secure ample width. The construction of a few new arterial roads was proceeding at the present moment, and afforded a valuable outlet for unemployed labour, but no carefully-thought-out plan of roads for the future of London had yet received official sanction. That was one of the first duties which must be assumed by the new authority.

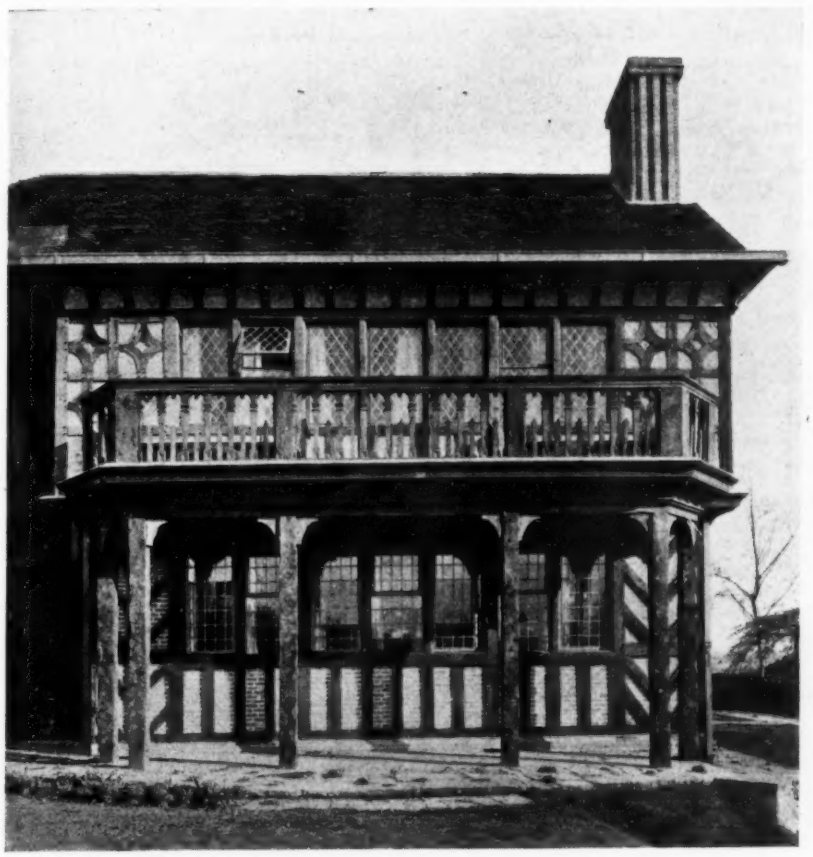
SEWERAGE AND SEWAGE DISPOSAL.—In such a large grouping of municipalities as occurred in Greater London it would be obvious that the geographical and natural features of that portion of the Thames Valley would group the authorities into two main divisions, north and south of the river respectively, and each tributary stream, such as the Lea, would again divide each of those areas into smaller subdivisions. Regarded in that light, Greater London split itself into at least a dozen main natural divisions.

Fifty years ago the formation of joint drainage boards based on these natural areas was a practicable proposition, and in several cases proposals were made for the amalgamation of authorities for drainage purposes. The number of little sewage disposal works scattered all over Greater London, and discharging their effluent into the Thames or its tributaries, was a monument to the unnecessary cost of dealing with such matters by administrative boundaries instead of in natural drainage areas, under which enormous savings might have been effected.

BUILDING CONTROL.—At present the system of building control in the metropolitan area was difficult for the architect or surveyor, and almost impossible for a layman to understand. In



"Commonwood" House, Chipperfield: New Corners of the Garden.
MESSRS. BENNETT & HOSSACK, AA.R.I.B.A., Architects. (*See p.* 75.)

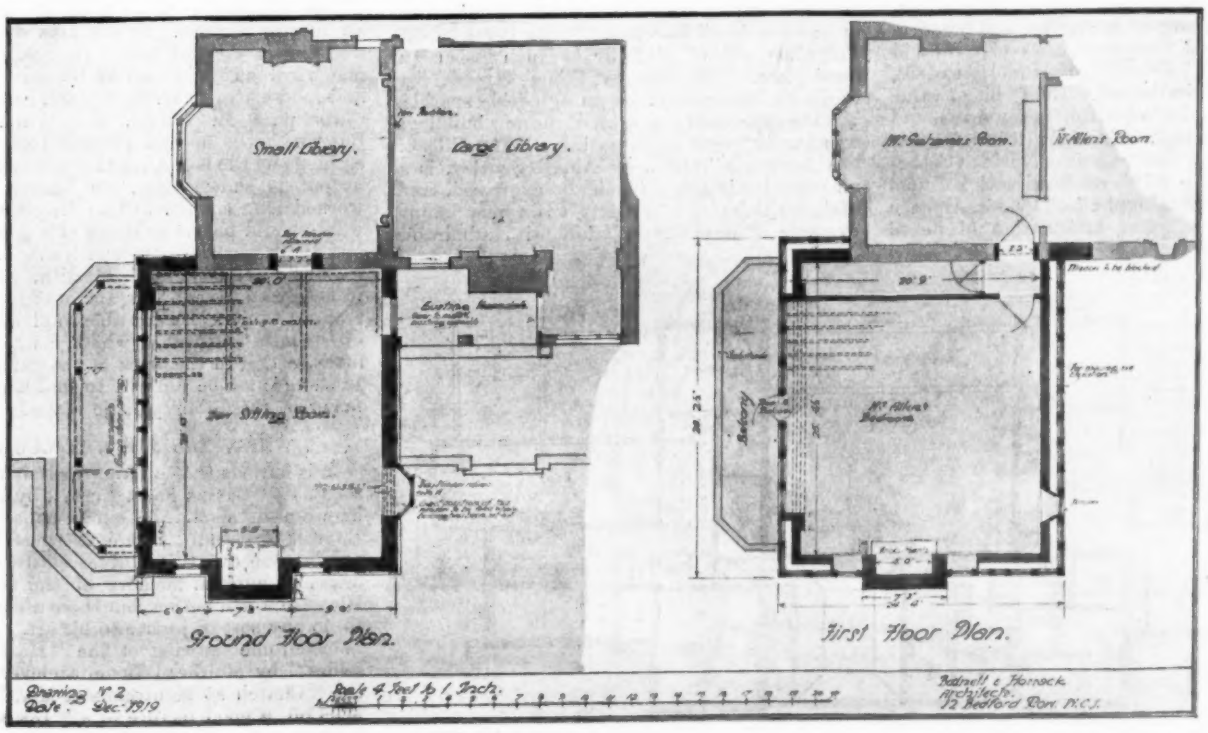


Additions to "Commonwood" House, Chipperfield.
MESSRS. BENNETT & HOSSACK, AA.R.I.B.A., Architects. (*See p.* 75.)

the L.C.C. area the London Building Acts were in force, administered by the various district surveyors. In the outer area there were some 90 local authorities, each with its own set of by-laws which differed materially from those of the adjoining authorities. The present diversity of practice between the inner and outer areas would probably remain until necessity arose for an alteration in the law. The agitation which had recently been conducted for higher buildings in London pointed to the necessity for careful consideration to be given, in any revision of the building code, to the changing conditions of London. Districts which had always been residential were slowly invaded by commercial or business premises, and everywhere in the central districts there was a tendency for buildings to become higher. The present limit of height in the L.C.C. area (80 ft. plus two stories in the roof) was in the opinion of many amply sufficient. Cases would arise where higher buildings might be allowed, and the discretionary power should undoubtedly rest with the central planning authority. The same authority should also have power to set aside districts or zones for industrial and residential use and for prescribing the conditions as to height and space about buildings, width between buildings, and building lines generally. The actual administration of the building code must, however, be in the hands of the local surveyors.

PLANNING OF NEW ROUTES.—The London County Council had, up to the present, refrained from exercising its powers with reference to town planning. No official reasons for that inaction had been given, but it might be assumed that the reasons were:—(1) The comparatively limited amount of open space and building land within the county boundary; (2) a reluctance to go outside the county boundary; (3) fear of claims for compensation. It was fortunate, perhaps, that there had been little building during the past seven years, but even during the twelve years which had elapsed since the passing of the first Town-Planning Act in 1909 a good deal of development had taken place, even within the county area. Meanwhile, the local authorities in outer London had not been idle, and much preliminary work had already been accomplished, so that the compulsory clauses of the Housing, Town-Planning, &c., Act, 1919, when they came into effect, would not find them wanting. A tendency which was distinctly encouraging was the voluntary grouping of local authorities for the purposes of town planning. Much co-ordination was, however, necessary, and the Ministries of Health and Transport would, no doubt, assist in that direction until a new central authority for the purpose was formed. One of the changes which was slowly taking place was decentralisation of industries. One by one the big firms of manufacturers were leaving the central districts, sometimes to settle in the outer ring—where land was cheaper and transport and housing both available—and sometimes to start afresh in a country town.

HOUSING.—No one had yet attempted to deal with London's natural growth by a complete system of well-designed satellite towns The new authority would be able to do so if it desired, and it should be borne in mind that they need not necessarily be new towns, and that there were numerous country villages anywhere within a radius of fifty miles which, with improved railway facilities, would make ideal centres for such an experiment. Housing was clearly a subject in which the central authority and the local authorities would be called upon to act together. The local authorities should be primarily responsible, but should be able to look to the central co-ordinating authority for substantial help and financial backing.



Additions to "Commonwood House," Chipperfield.
MESSRS. BENNETT & HOSSACK, AA.R.I.B.A., Architects. (*See p.* 75.)

EXHIBITION NOTES.

THE PASTEL SOCIETY.

The Pastel Society does not seem to attract to its ranks many able and sincere artists. The Pencil Society is incorporated with it, but one can only wonder at many of the things exhibited, which surely can have been as little pleasure to the artist as to anybody else. The honours of this year's exhibition lie with Mr. Leonard Richmond, who has one large landscape and four smaller ones grouped round it in the principal place in the large gallery. The large picture is "Early Morning near Puy," and is a fine luminous piece showing all the artist's mastery of plane surfaces and scintillating lights. Of the smaller pictures, the "Sunset near Le Puy" is a little gem of rich, glowing colour. H. Davis Richter has a group of subjects rich in colour and telling dramatic effect. Mr. Redworth's drawings are always worth noting, and he has a group of six which, with some delightful drawings of Terrick Williams (230–235) are amongst the best things in the exhibition. Bernard Partridge, in excellent colour (218 and 219), T. W. Hammond and Lewis Baumer are contributors of good things. It is a pity that there is so much shown which does not seem to advance the art of pastel.

THE SOCIETY OF GRAPHIC ART.

The second annual exhibition of the Society of Graphic Art at the Suffolk-street Galleries is more impressive in some ways than the first, and the large gallery, which is well hung, contains several admirable exhibits; the smaller galleries are quite undistinguished by comparison. Architecture is always a difficult matter for non-professional handling, for the emphasis is so liable to be laid on the wrong points. We know that many illustrations of architecture by architects fail through an over-emphasis of detail, and too keen a sense and knowledge of detail and construction often prevent an adequate breadth of treatment. Few architects could so completely subordinate detail to breadth of effect as the late E. A. Rickards: he drew with a breadth and vigour which often seemed contemptuous of detail, yet his knowledge of it was felt through his loosest handling. But this difficulty of knowing too much is one of the reasons why one likes to see a painter's handling of architecture if he will only draw it in right perspective, and give us a proper sense of its masses, proportions and accentuations. We have in the view of the Cardiff City Hall (218), by Sidney Tushingham, an appreciation of the picturesqueness of Lanchester and Rickard's fine group of buildings, but not of the architectonic feeling and breadth. On the other hand, the presentation of "The Old Tide-Mill" (133), by Frank L. Emanuel (see p. 66), is all that could be desired. Every bit of value of this charming little building is conveyed, and with a feeling of real distinction; it is a delightful little etching. The "Choir of Norwich Cathedral" (163) (see p. 67) is rendered with softness and admirable breadth of effect by Jas. Alphege Brewer, with sufficient articulation of detail to make it pleasing to the architect. The fine etching of "Pont Neuf," by Frank Brangwyn (159), suffers a little from over-accentuation of detail. There is both tenderness and force in 141, "York Minster," by Ernest L. Hampshire, and a strong sparkling plate is "St. Wulfram Abbeville" (145), by Percy J. Westwood. A delicately treated etching by A. Hugh Fisher illustrates "La Sainte Chapelle, Paris" (151), and there is some quality in "Whitehall" (179), by Ernest L. Hampshire. "The Belfry, Bruges," (189), by Sydney Long, is a pleasing etching, but the detail of the belfry itself is unsatisfactorily vague; the artist could not afford to ignore the detail like this. "The Porch of St. Trophime, Arles" (217) by A. Hugh Fisher is a good plate. "St. Clement Danes, Strand," by Chris. M. Shiner (210), has an agreeable sparkle, but the ephemeral steelwork of the new buildings was hardly worth perpetuating. "The Hills of the Auvergne" (125), by Alfred Bentley, is a pleasing landscape charmingly expressed, and Malcolm Osborne's "Le Puy" is a very happy example of economy of effort with admirable breadth and distinction. Nos. 95, 98, 107, 110, 114, 245, 239, 232, 221, and 216 are all worth noting. In the North-West Gallery Sir Reginald Blomfield has a pencil sketch of "Coutances" (10) which gives the great church with admirable distinction in the landscape. What is styled "pen-and-ink" but looks like an admirable piece of wood engraving, is the beautiful "Landscape Study," by F. L. Griggs (39). The tone and plane values, the colour and light in the drawing, place it on a high level of accomplishment.

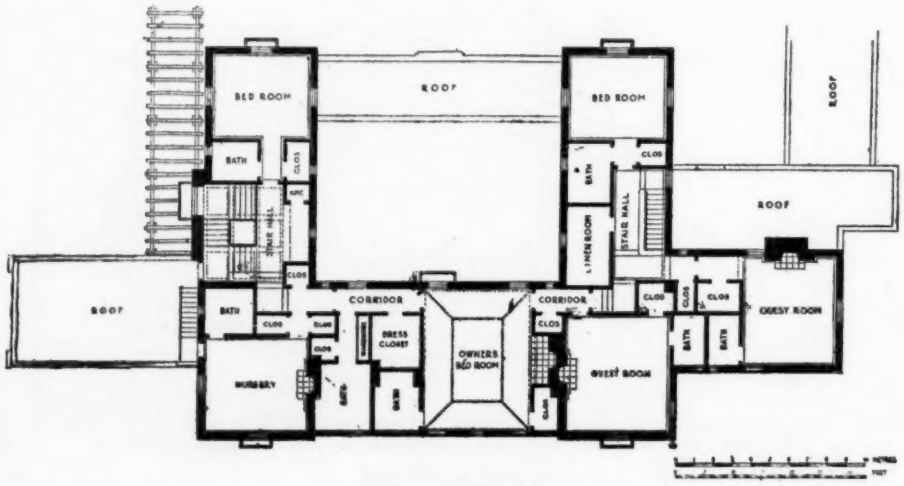
St. Clement Danes, Strand.
From an etching at the Graphic Art Society's Exhibition, by MR. CHRISTOPHER M. SHINER.

ETCHINGS AT THE A.A.

The exhibition of etchings at the A.A. is an interesting one. It contains some of the well-known work of Ernest George, R.A., some fine, vigorous landscapes by Lancelot L. Goldie, and good plates by W. M. Keesey, Palmer Jones, Christopher M. Shiner, and William Ansell. But the more special interest centres in the etchings by the late Alick Horsnell, whose whole output is shown here, we believe. He had worked long enough in this direction to know what should be the qualities of a good etching, and all his work is instinct with charm. Delicacy, freedom, precision and breadth, are marked in nearly all his subjects, and of course in architectural subjects he was able to give that touch of definite suggestion which, as a rule, is a little lacking in the work of the painter-etcher. It should not be difficult to find a market for many of these dainty little plates.

NEW ENGLISH ART CLUB.

It is curious that a dainty, sensitive drawing such as a "Sussex Farm" (187), by H. Bellingham-Smith, should be exhibited at the New English Art Club, where there is hardly an exhibit one can think of seriously. The few drawings hung in memory of the late A. W. Rich are worth noting, but there are not enough to do any sort of justice to his art. A striking monochrome drawing of the "Heart of Marseilles," by Muirhead Bone, a clever sketch of the "Church at Montreuil-sur-Mer," by D. S. MacColl, a good picture of a "Disused Slip at Southampton Water," by Fred Brown, and a good painting of a very comely lady, by R. Schwabe, seem to complete the list of contributions to beauty or interest.



SECOND-FLOOR PLAN.

Residence at Santa Barbara, California. MR. BERTRAM G. GOODHUE, Architect.

LEADING CONTENTS.

	PAGE
SMOKE AND ITS EVILS	65
NOTES	66
GENERAL NEWS	68
COMPETITION NEWS	68
CORRESPONDENCE	69
THE ARCHITECTURAL ASSOCIATION	70
ROYAL ACADEMY WINTER EXHIBITION	71
SURVEYORS' INSTITUTION	72
EXHIBITION NOTES	74
LONDINIUM: ARCHITECTURE AND THE CRAFTS	82
R.I.B.A.	83
OBITUARY	84
THE ELEMENTS AND THEORY OF ARCHITECTURE—II	85
ARCHITECTURE AND THE PUBLIC	86
HOUSING AND TOWN PLANNING-NOTES	86
THE TOWN-PLANNING INSTITUTE	87
THE BUILDING TRADE	88
STRENGTHS OF WALLS AND FLOORS	88
ENGINEERS' REPAIR SHOP AT SHEFFIELD	89
NEW BUILDINGS IN LONDON	90

ILLUSTRATIONS.

Additions to "Commonwood" House, Chipperfield.

The wing illustrated in this issue was added to "Commonwood," a country house overlooking a fine stretch of country about four miles from Rickmansworth, and has just been completed for Mrs. W. E. Allen.

The general proportion and design were modelled on the half-timber work of the late sixteenth century. The accommodation consists of a study on the ground floor and a bedroom on the first floor connected with an internal staircase; the bedroom opens upon the balcony overlooking the lawns. The oak used throughout was obtained from old buildings, part coming from the belfry of Watford Church and part from an old barn in the vicinity. Considerable difficulty was experienced in obtaining the long lengths required for the supports to the balcony and some of the other large pieces. The roof tiles have come from various old buildings in the neighbourhood. The local craftsmen employed showed great skill in laying the tiles, some of which were flat, some concave, and almost all of different shapes and sizes. Particular attention was paid to the junction of the old and new roofs, and in the actual building this is particularly satisfactory. The garden around the building was designed to harmonise with the existing lay-out and to connect the new to the old work. The paths are finished with a rough old Yorkshire stone, particularly suited to its purpose and very picturesque. The space prepared for a well-head was completed by the purchase of a genuine old piece, as shown in the photograph. The bricks are new 2 in. brindled, and the windows are glazed with leaded lights of the type used in the sixteenth century. Choice and handling of material have played an important part in the execution of the work, and the effect obtained appears to justify fully the difficulty experienced in obtaining the exact finish and treatment required.

The addition was built by a local builder (the late Mr. W. F. Pritchard) with local labour, under Mr. T. Downer, who is now carrying on the business. The steel sashes and leaded lights were supplied by Mr. J. Binder, of Arton Glass Works, Camden Town; the bricks were supplied by Messrs. Lamb & Sons, Shoe-lane, E.C.; the plaster work on the first floor was executed by Messrs. G. Jackson, of Rathbone-place, W. The architects were Messrs. Bennett & Hossack, of 12, Bedford-row, W.C. 1.

St. Thomas's Church, New York City.

The architects of St. Thomas's Church, Fifth-avenue and 53rd-street, New York City, are Messrs. Cram, Goodhue & Ferguson, of New York City. The reredos and chancel furniture are from the designs of Mr. Bertram G. Goodhue.

Residence at Santa Barbara, California.

The house at Montecito, Santa Barbara, California, has been built for Mr. Henry Dater from the design of Mr. Bertram G. Goodhue, of 2, West 47th-street, New York City.

The Church of St. John, Walthamstow.

This church, of which Mr. H. P. Burke Downing, F.S.A., F.R.I.B.A., is the architect, is to be built to take the place of an existing church on the same site erected in the early part of the nineteenth century, of poor design and structurally unfit for restoration. The new church will have seating accommodation for 730 persons. It is to be built of Crowborough bricks and Clipsham stone, with tile roofs.

The Birmingham War Memorial Competition.

We illustrate this week the design submitted in the Birmingham Hall of Memory Competition by Messrs. Herbert T. Buckland and William Haywood, FF.R.I.B.A.

In their report they stated: "The conditions as laid down include an important factor which greatly influences the type of design appropriate for this memorial. It is required to stand in relation to future public buildings, and at the same time be appropriate to the present site. Ultimately it is to be seen from roads on three sides, and it is even possible that at some future time the site may be completely isolated. Two conclusions are drawn from these conditions:—First, the importance of leaving the site as open as possible by keeping the external mass of the memorial comparatively small, and, second, the need for a design which will stand well in relation to future buildings, whatever their character. In seeking for a suitable type of design, it has seemed desirable to avoid the small temple motive, which, as a small building, would challenge comparison with the buildings to be erected later, and for a somewhat analogous reason, the usual references to death have been subordinated to praise of all war sacrifice, including death, but embracing many phases of devotion to duty which deserve commemoration.

"The site is laid out as a simple formal garden, which gives a spacious architectural setting for the monument. The central area, 206 ft. by 41 ft., is lowered for effect, and to help both æsthetically and practically, the approach to the memorial. The level at which the chapel is placed emphasises its character in an appropriate manner, and has the further merit of bringing the side aisles under the stepped base, so that a suitably dimensioned memorial chamber is obtained, of which only the central aisle projects into the external mass. The chapel will accommodate 300 people standing, but it is not designed for such assemblies. After the first few days the normal attendance will be small. The plan is arranged, however, so that indefinite numbers of people may visit without disorder. The shrine is immediately opposite to the entrance, and visitors after visiting the shrine will pass to the left or right to the exit lobbies. There will be no return through the ranks of those who follow.

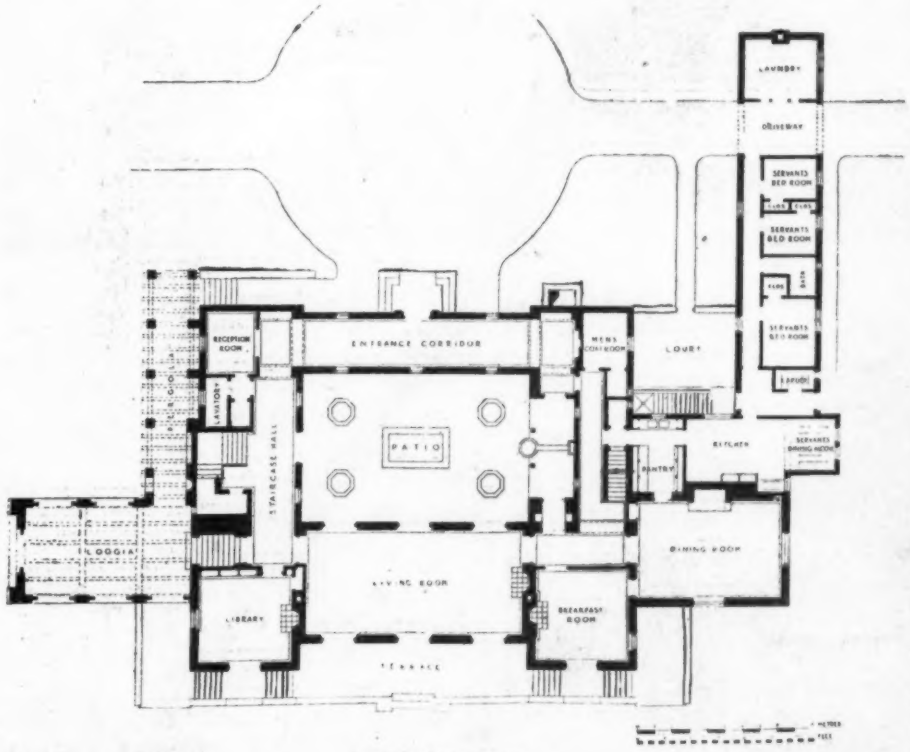
"The shell of the entire building would be of reinforced concrete, providing an imperishable core, covered internally (as far as funds permitted) with marble and mosaic, or alternatively with a colour scheme on plaster. The artificial light would be electric, screened to give soft effects, and by using electricity for warming purposes it would be possible to avoid all fume or smoke externally. The outer covering of the memorial would be Portland stone with a certain amount of marble, steps of grey granite, and pavings of York or equivalent stone. The statuary group and the doors in bronze.

"It is not desirable to attempt a detailed description of the symbolism employed. The equestrian statue indicates the spiritual and physical ideals exacted by the ordeal of the great war. There is a hint of the sea in the 'seahorse and shell' motive, and panels painted on the inner walls would indicate the virtues that war brings into prominence."

A review of the designs submitted in this competition was given in our issue for December 16 last; the first premiated design, by Messrs. S. N. Cooke and W. N. Twist, FF.R.I.B.A., was illustrated in our issue for December 9 last.

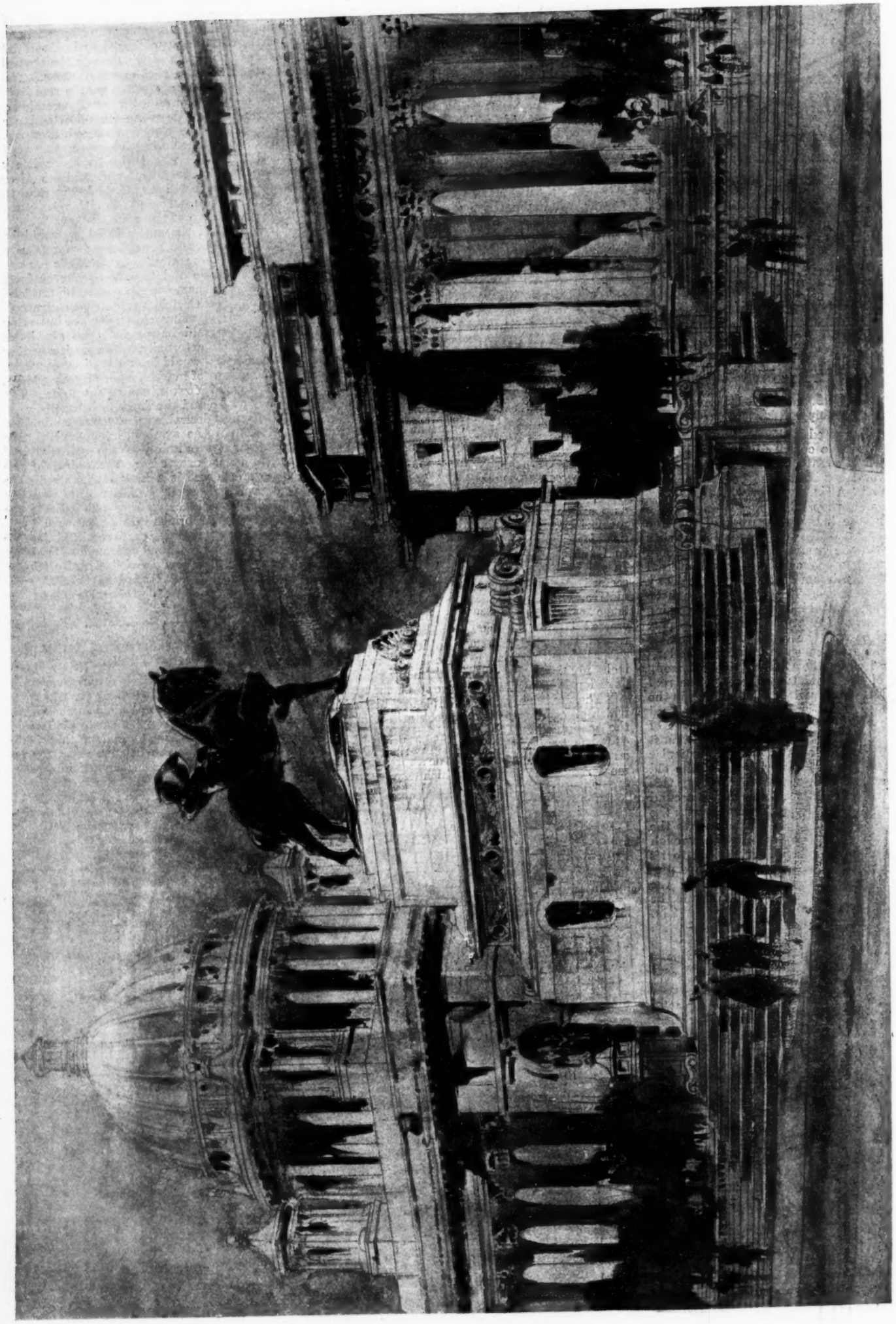
The Architects' and Surveyors' Assistants' Professional Union.

The work of the Architects' and Surveyors' Assistants' Professional Union for the year ended May 31, 1921, is embodied in the annual report, published as a supplement to the December, 1921, issue of the *Journal* of that body, which also contains the balance sheet for the same year and notes on matters of interest to its members.

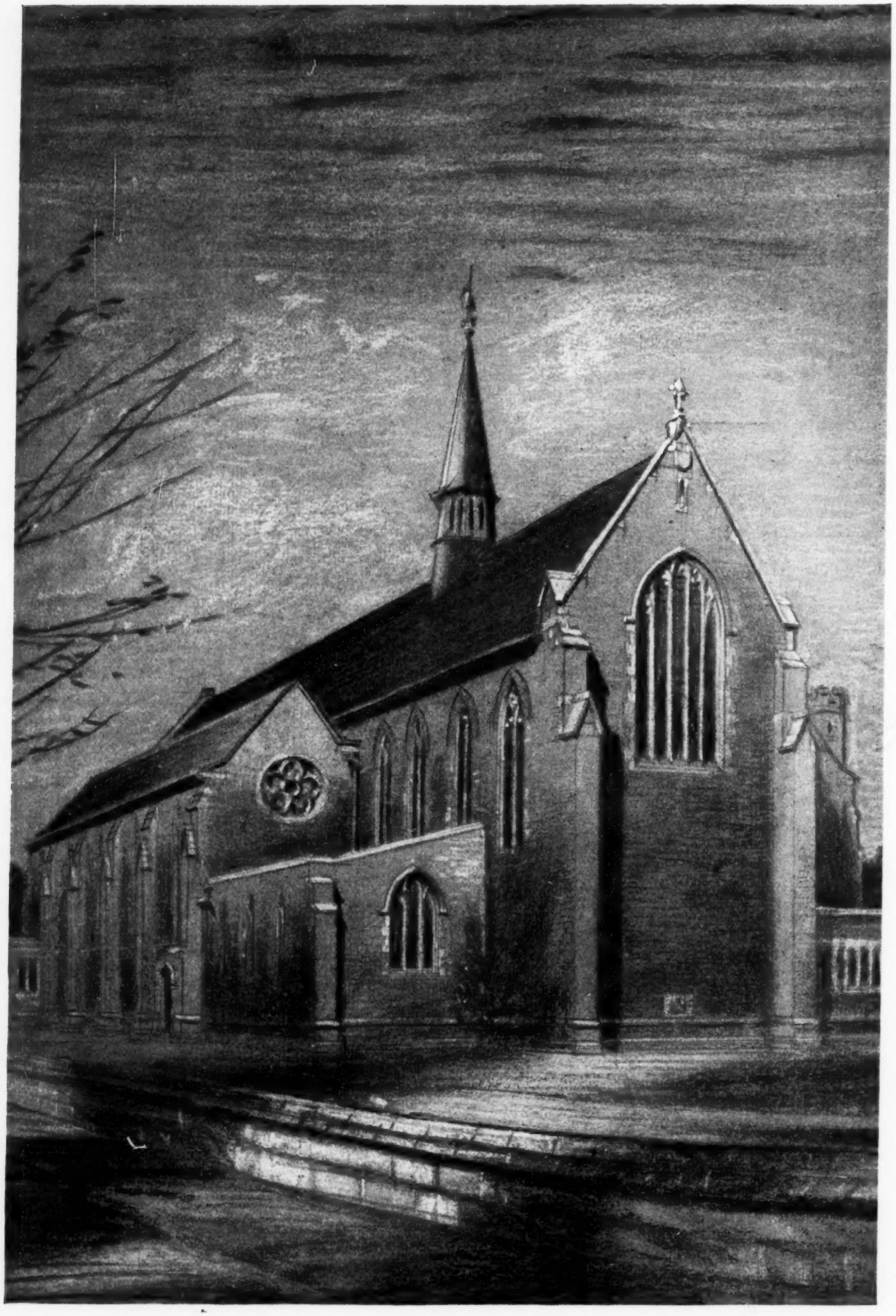


FIRST-FLOOR PLAN.

Residence at Santa Barbara, California. MR. BERTRAM G. GOODHUE, Architect.



Birmingham Hall of Memory Competition. Design submitted by MESSRS. BUCKLAND & HAYWOOD, FF.R.I.B.A. (See p. 75)

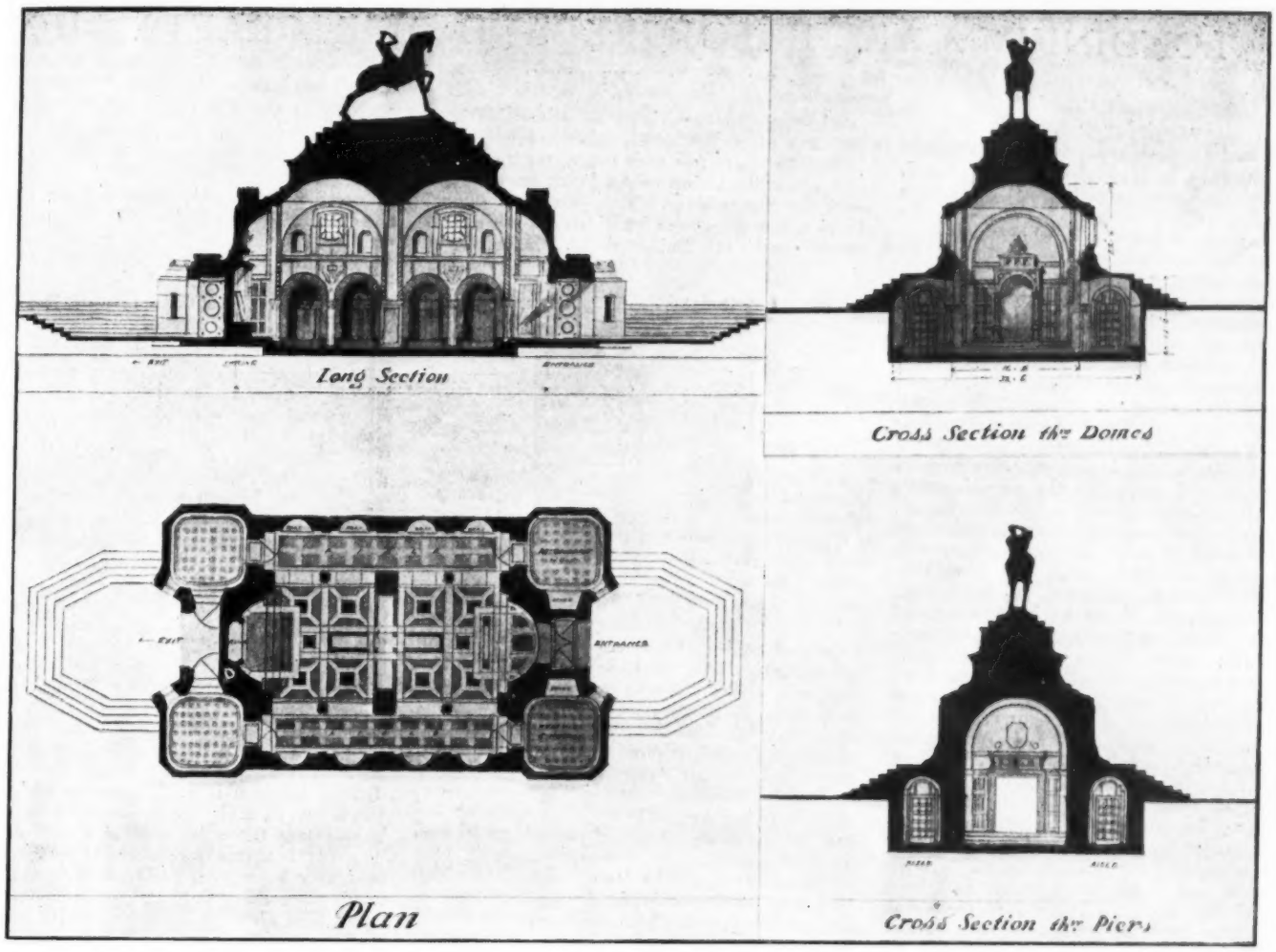


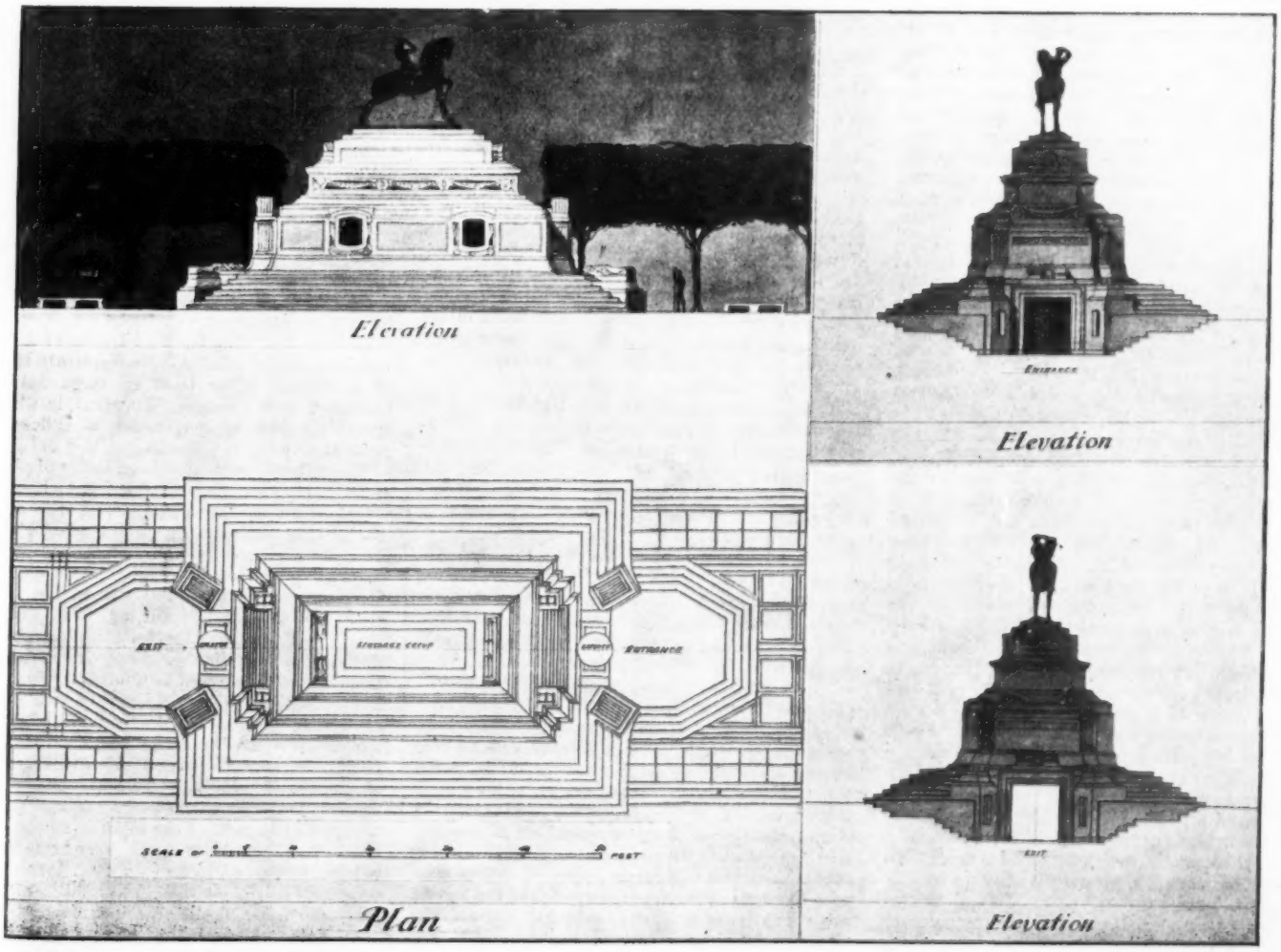
New Church of St. John, Walthamstow. MR. H. P. BURKE DOWNING, F.S A., F.R.I.B.A., Architect. (*See p.* 75).

New Bank at Plaistow. MESSRS. NIVEN & WIGGLESWORTH, FF.R.I.B.A., Architects.

These new premises at Plaistow, for the London County Westminster & Parr's Bank, Ltd., are situated on the important corner of Barking-road and New Barn-street, Plaistow, E. The ground floor contains the banking hall, manager's room, and the usual offices. The upper floor, entered from the side, is reserved for use as a caretaker's flat. The parapet, entablature quoins, and base are of Portland stone.

The general contractor was Mr. W. J. Maddison, of 127, Minories, E.C., and the architects Messrs. Niven & Wigglesworth, FF.R.I.B.A., of 7, John-street, Bedford-row, W.C.





Birmingham Hall of Memory Competition. Design submitted by MESSRS. BUCKLAND & HAYWOOD, FF.R.I.B.A (*See p.* 75).

LONDINIUM: ARCHITECTURE AND THE CRAFTS.—I.

BY W. R. LETHABY.

(*Concluded from p.* 35.)

Wattle and Daub.—It was ever a problem in London how to build without stone. Wood, gravel and mud were plentiful, and these were the common walling materials during the Middle Ages. As lately as the eighteenth century some of the suburban churches were described by Hatton as being of "boulder work," that is, a concrete of coarse gravel; and the walls of the Temple Church before the falsifying restorations were of some sort of concreted rubble skinned over with plaster on the face. Mud walls are mentioned in mediæval records, and daubers were, I suppose, primarily those who did the filling in of post and pan work. The smaller houses of Londinium were largely of wattle and daub, and doubtless others were of crude brick and cob. For the use of wattle and daub we have plentiful direct evidence. In the account of the excavations in and about Lombard-street in 1785 (*Archæol.* VIII) curious fragments were found which are thus described:—"About this spot and in many other places large pieces of porous brick were met with of a very loose texture, seeming as if mixed with straw before they were burnt. They are commonly channelled on the surface; their size is quite uncertain, being mere fragments, their thickness about one inch and a half or two inches." Again, chalk-stone foundations and "channelled brick" are mentioned together. The "brick" fragments were of daubing, and the channels were the marks of laths, as has been shown by other finds. Similar remnants have recently been discovered on the Post Office site and in King William-street. "ebris of a wood and daub house which had been destroyed by fire. . . . In several cases the plaster was still adhering to the daub." (*Archæol.* 66.) Other fragments are preserved in the Silchester collection at Reading. The London fragments were found under conditions which showed that they had belonged to the first century dwellings. This method of building had been practised by the Celts, and we may imagine that the "populace" of Londinium was housed in small huts of wattle and clay roofed with reed thatch. In the country old garden walls are occasionally found, I believe, built of mud daubing on both sides of wattle work, and sheep shelters of wattle-hurdles and dry fern are, I suppose, direct descendants of the old British manner of building.

Mr. Bushe Fox has remarked that one of the earliest houses at Silchester and the earliest houses at Wroxeter were of wattle and daub construction.

Hypocausts and Flue Tiles.—Several examples have been found in London of the Roman system of heating buildings by hypocausts. These were low under-floor spaces a foot or two high connected with an external stoke-hole in one direction and having a flue or flues in the other. When it, as was frequently the case, occupied the whole space below a chamber the floor was supported on a large number of roughly built little piers with a row or two of flat tiles above spanning the intervals, and over them a layer of concrete and a mosaic or other floor. The flues were usually box-tiles, and in the case of the hot chambers of a bath the side of a wall or even more might be lined with them. A hypocaust with its stoke-hole and flue or flues was really a kiln of low power, in which people were warmed on a similar principle to the baking of pottery. The box-tiles were much the shape of a modern brick, and about twice as big; they were hollow and usually had scorings or impressed patterns on the surface to make mortar or plaster adhere. (Figs. 7 and 8.) Frequently they had a hole or two holes in their narrow sides; this would have allowed the draught, when there were more than one row of box-tiles, to pass from side to side towards the chimney or vents. In the British Museum there is a long and large pipe with ornamental scratchings on the surface which may possibly be a chimney.

The system of central heating by the hypocaust seems to have been an admirable contrivance. Lyson's illustrated an example at Littlecote where flue tiles ran up in the angles of a room like Tobin tubes, being cased round only by the plaster. The two best known London examples were found in Lower Thames-street and in Bucklersbury. The former

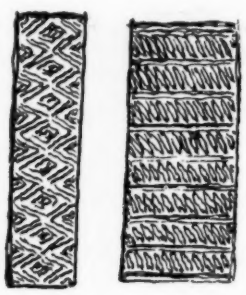


FIG. 8.

extended under the floors of two adjoining apartments. The Bucklersbury example had channels under the floor spreading to several wall flues, each being of two box-tiles placed side by side. (See Price's account and V.C.H.) Occasionally flue tiles had two smaller channels; there is a broken example of such a tile in the British Museum. Flue tiles were sometimes of a rounded form ∩ and in this case the wall itself must have served to enclose the flue. In the excavations in Lombard-street in 1785 (*Archæol.* VIII) a brick wall is described which had two flues, one being "semi-circular." A long and well-made ∩ shaped flue in the British Museum, with an impressed lozenge pattern on the surface, is described as a ridge tile. There is also a fragment of still larger diameter at the Guildhall. Similar flues found at Woodchester were used as horizontal heating channels under the floor. Here also one of the walls was found to be lined with flanged tiles, ⌊⌋ ⌊⌋ set thus, with the flanges against the walls. This may have been a provision against a damp wall. I have seen a similar wall in Rome—I believe, subterranean—also another very similar where large flat tiles, having four projections at the back like short legs to a low stool, were used as linings. Each of the four studs was pierced for a nail. Fragments of tiles found at Newgate in 1877 were about 1½ ft. square and 1¼ in. thick, "with rough clay stubs for attachment"; they were scored over the surface with wavy lines, and were probably used internally. (In V.C.H. it is said that these may have been mediæval, but the examples just given show that they were Roman.)

The impressed patterns on the surfaces of some of these flue tiles are quite neat and pretty, and they are interesting in the history of design

FIG. 9.

as being all-over patterns. In some cases at least they seem to have been produced by a roller having a unit of the design cut on it in the style of a butter print. A tile found in Kent, illustrated by Haverfield ("Romanization," p. 33), has the inscription: "Cabriabanus made this wall-tile" (*parietalam*)—"The man who made the tiles apparently incised the legend on a wooden cylinder and rolled it over the tiles producing a recurrent inscription." The patterns superseded the scorings and seem to have been for the same purpose—to afford a better hold for the plaster than a plain face. Fig. 8 is of tiles found in Thames-street. Fig. 9 is a fragment illustrated in Roach Smith's Catalogue.

Inscriptions roughly scratched on tiles led the late Dr. Haverfield to the conclusion that ordinary workers in Britain wrote Latin. At the Guildhall a tile has a humorous note about a workman who went off "on his own" too often. In the British Museum a tile has *Primus*, and one from Silchester has *Satis*.

Floors.—The floors which have been found were most generally of concrete, tiles, and mosaic. In Rochester Museum are some lumps of material from concrete floors. There were also floors of "rough stones" and of "chalk stones." A better kind of concrete floor was that known as *opus signinum*, made of lime and broken pottery polished on the surface; this made an admirable floor. Another excellent and much used surface was obtained by coarse tesseræ of tile from 1 to 2 in. square; sometimes pieces of yellow, black and white were intermixed. In Rochester Museum is a fragment subdivided by indented lines imitating this coarse kind of mosaic and a square of light buff tile. At the Guildhall is a tile a Roman foot square, having incised squares. Tiles were of various forms and sizes. In the Reading Museum are round and polygonal tiles, and a very pretty floor formed of such tiles with coarse tesseræ intermixed. In the British Museum is a 7 in. square and a large tile about 18 in. by 14 in. scored on the surface neatly like the crosses of a Union Jack (*cf.* Fig. 7); it seems to be abraded on the surface, and may be a paving tile—if so it must have made an excellent floor. Roach Smith mentions large tiles about 2 ft. square and 3 in. thick, and some of these are in the British Museum.

In the British Museum and at the Guildhall are portions of paving of small tiles set on edge in a herring-bone pattern. The former is described as having been found at Bush-lane, the latter near Dowgate-hill on the Walbrook. "Near by was piling and the cill of a bridge which crossed the brook from E. to W." This seems to be the same pavement as that described in *The Builder*, 1884, as being on the west bank facing the brook; there was a second landing stage in Trinity-square Gardens, on "the edge of a haven," with a pavement over oak piling. (The haven at the tidal inlet to Walbrook was doubtless the original port of London.) I have seen similar herring-bone pavement of tiles on edge in Rome.

Plastering.—External walls would mostly have been plastered. C. Knight mentioned the discovery near the Bank of traces of a Roman building and of what was "apparently the basis of a Roman pillar built of large flat bricks incrusted with a very hard cement, in which the mouldings were formed exactly as is done in the present day."

Rome itself must have been a city of plastered walls; the Pantheon, the great Basilica of Constantine in the Forum, and the splendid Baths were all, as may be seen to-day, plastered. The tile walls of the Basilica at Treves were covered with red plastering. The Baths at Silchester were plastered externally. Of the great villa at Woodchester we are told the walls were "plastered on the outside and painted a dull red colour" (T. Wright). At Caerwent the Basilica was plastered a reddish brown colour. The best description I have found of such plastering is that in *Archæologia* of a round temple or tomb building found at Holmwood Hill, which was covered outside with "a mixture of lime and gravel and coarse fragments of broken tile. On this was laid a coat of stucco composed of lime and tile more minutely broken, the latter being rendered very smooth was covered with a dark pigment . . . a sort of ochre." It is clear that external plastering was generally finished with a red surface.

Of internal plastering we have many fragments covered with painted decoration in the museums; it was generally very thick and

smoothly finished on the surface; against the floor there was usually a projecting quarter-round fillet about 3 in. high, of hard cement. Such a skirting was found around the Bucklersbury mosaic pavement (Price). Sometimes a similar fillet ran up the angles of a room, as at a bath at Hartlip Villa, illustrated by T. Wright. I have seen a similar treatment in Rome, also a hollow curve.

Roofs, Windows, &c.—Roofs were generally covered with tiles, stone-slates, and doubtless thatch. Examples of the two former are in our museums. The flat tiles had turned-up edges; these were removed near the top for the next tile to lap over. The flanges were covered by half-round tiles, larger below than above, so that one lapped over the other. The flat tiles were frequently if not always of a key-stone shape, so that the bottom of the upper one set into the wider top of the lower one. (See one figured in Allen's "London"). Some have a single nail hole near the top, but others, I suppose, can only have been nailed against the slanting sides. (See V. le Duc's article *Tuille* for the Romanesque system.) In better work ante-fix tiles covered the terminations of the round tiles at the eaves. "Part of an ante-fix of red terra-cotta in the form of a lion's mask" was found in the Strand (V.C.H.). There are several in Reading Museum and one in the British Museum from Chester. The slates were thick and of a pointed shape below, forming diagonal lines when laid. Both the stones and tiles were very heavy and must have required strong timbering.

Ridges were of tile or stone. A fragment in the Reading Museum from Silchester has a knob rising from the saddle-back of a ridge-tile strangely mediæval in appearance. (Fig. 10.)

FIG. 10.

I cannot determine if it came at the ends of the ridge only or if every tile had such knobs (*cf.* V. le Duc *Faitiere*). Ridges were frequently terminated by stone gable knobs, which have been found in many places (see Ward's "Roman Buildings"), and occasionally in such a position as to show that a gable end fronted a street. A ridge termination in Exeter Museum is shown upside down as if it were a corbel (Fig. 11 is a memory

FIG. 11.

sketch). These terminations are late derivations from acroteria and prototypes of gable crosses; they are links in a continuous chain from Greek to Gothic.

Little joiner's work has survived to our day. Doors would not have been very different from our own, as is shown by many examples of framed panel work from foreign sites in museums. A bronze pivot in the Museum at Westminster Abbey must have been a hinge of a door. (Fig. 12.) Iron strap-hinges in our museums are very similar to our own. There are two in the British Museum. (Fig. 13.) The plane found at Silchester is evidence for joiner's work. In Leicester Museum is a fragment of a lion's head and leg from a piece of furniture—probably a table. Turning in a lathe was practised, as some wooden dishes at the Guildhall show. There are many excellent locks and keys and hinges and handles in our museums The use of window glass was

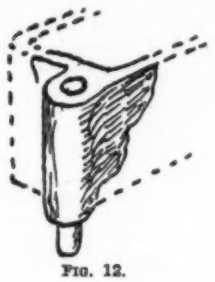


FIG. 12.

very general. It was cast in small panes, as is shown by the large proportion of existing fragments which have edges and corners. Practically a whole pane, about 12 in. by 12 in., is in the Rochester Museum. Near Warrington, on a Roman site, was found a stone slab with a shallow recess 12 in. by 8 in., which Mr. May regarded as a mould for glass (Ward). The

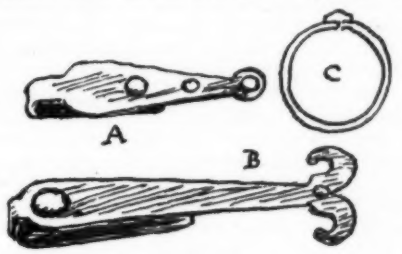


FIG. 13.

average size of panes would have been about one Roman foot long. Glassware seems to have been made in London, Silchester and elsewhere, doubtless from imported "metal." Some windows possibly unglazed were protected by iron gratings. An iron star X in the Guildhall Museum came from such a window guard as is shown by a complete example I sketched many years ago in the Strasbourg Museum (see *Arch. Rev.*, May, 1913). (Fig. 14.) It had been

FIG. 14.

suggested that such X-pieces were "holdfasts," to keep the glass-panes in position (Ward); but this is not the case; moreover, the pane at Rochester shows that it was "cemented" into place.

Lead must have been largely used; there are a dozen large "pigs" in the British Museum. Melted lead was found at Verulam in a position which suggested that it had been used on an important building. In the Guildhall Museum are some sections of lead water-pipes found in London, and at Westminster Abbey is a piece 4 in. in diameter, which must, I think, be Roman. (Fig. 13, *c.*)

A study of Roman building methods may suggest to us many points for our consideration and emulation. I would especially mention their excellent mortar, made of crushed tile, *opus signinum*, and coarse tesseræ floors, cement skirtings, red external plastering, the tile-shaped brick, tile wall linings and down-pipes, hip and gable knobs, vaults of box tiles and pipes, the hypocaust system of heating, turning of stone-work, painted decorations, marble linings, cast lead work. Some day I hope our sterile histories of "architectural styles" will make way for accounts of practical building methods.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The Final Examination.

THE following are the alternative problems in design set for the Final Examination of the Royal Institute of British Architects, 1922:—

Subject LXI.

(*a*) A MOTOR GARAGE.—The building is to be erected on a level corner site in a large town. Dimensions of site: 200 ft. by 100 ft. The garage to be on three floors—basement, ground, and first. The main access from the street for the automobiles to the basement and first floors to be by means of sloping ways, of maximum incline of 1 in 10. The ground floor to be level with the street. The object of this programme is to provide a maximum floor area with as few constructional supports as possible. In addition to the space required for the storing of motor-cars, a covered space on the ground floor to be provided for cleaning four large cars simultaneously.

(*b*) A BUILDING FOR AN ARCHITECTURAL SOCIETY. — The building will be situated in a main street, and have a frontage of 80 ft. Accommodation required:—Ground floor: Entrance hall, secretary's and administrative offices, council room, committee room; first floor: meeting-room (for lectures and exhibitions), with ante-room, President's room, and writing-room; second floor: small reference library, with store-room, librarian's room, committee room; lavatory and cloakroom accommodation to be provided in basement and on second floor; kitchen, &c., and caretaker's quarters—with separate stairs—to be provided either in basement or attic. Heating apparatus to be in basement.

Subject LXII.

(*a*) A new opening in a deer park wall (stone, 8 ft. high) is to be made for carriage gates—provide lodges for the ranger of the park, and for the married gatekeeper.

(*b*) A level island site in a country town, on which is to be built a row of small houses for gentlepeople of small means. The block to consist of six or seven houses, each house having an average frontage of 24 ft. The accommodation of the houses may vary from two to three sitting-rooms, from four to six bedrooms, and one or two bathrooms. The kitchen offices may not be placed in a basement.

Subject LXIII.

(*a*) A cricket pavilion for a county ground, with accommodation for, say, 300 spectators, lavatories, &c., lavatory and changing-room for amateurs and professionals, scoring-box, luncheon-room, small kitchen and staff-room, committee-room, &c.

(*b*) A sports club situated in a large garden designed to accommodate wealthy members interested in sport. It would be situated on two floors.

Drawings must be sent to the Secretary of the Board of Architectural Education, Royal Institute of British Architects, 9, Conduit-street, W.1. Drawings for subjects (*a*) are to have the shadows projected at an angle of 45 deg. in line, monochrome, or colour. Drawings in subjects (*b*) are to be finished as working drawings. Lettering on all drawings must be a clear, scholarly, and unaffected character.

The dates for sending in designs are as follows: Subject LXI: United Kingdom, February 28; Johannesburg, April 29; Melbourne and Sydney, May 31; Toronto, March 31. Subject LXII: United Kingdom, April 29; Johannesburg, June 30; Melbourne and Sydney, July 31; Toronto, May 31. Subject LXIII: United Kingdom, June 30; Johannesburg, August 31; Melbourne & Sydney, September 30; Toronto, July 31.

Fees for Housing Schemes.

A special meeting of the Practice Standing Committee is to be held on January 17, at 3 p.m., to confer with interested architects as to the proposed negotiations with the Ministry of

Health on a scale of fees for abandoned work. Members and Licentiates interested in Government housing schemes are invited to attend.

Unification and Registration.

A general meeting of Associates is to be held on January 24, at 8 p.m., to discuss the report prepared by the Associates' Committee on unification and registration.

Election of Members.

At a business meeting on Monday last, the following were elected to membership:—

As Fellows.	As Associates.
T. P. Bennett, London.	A. H. de S. Basto, London.
R. C. Foster, Buckhurst Hill.	J. H. Forshaw, Ormskirk.
	C. T. Pledge, London.
	C. L. Pope, Wimborne.
	E. Sheppard, Beckenham.

OBITUARY.

Mr. Edward Arthur Fellowes Prynne.

WE have received the following appreciation of the late Mr. E. A. Fellowes Prynne, a notice of whose demise appeared in our last issue:—

"It is not too much to say that the death of Edward Arthur Fellowes Prynne on December 28 removes from the religious art world an artist of very exceptional ability, and one whose absolute sincerity and devotion to the highest ideals of his art are stamped upon every kind of work of a religious character that he undertook. Being a son of the late Rev. George Rundle Prynne, for fifty-five years Vicar of St. Peter's Church, Plymouth (whose church was the first in which the Daily Eucharist was restored since the Reformation), Mr. Fellowes Prynne's early environment had had a strong influence on his later life's work.

"After preliminary study in art schools in London he went to Antwerp and studied under M. Verlat (whose influence is noticeable in his earlier work), and afterwards to Florence, Rome and Paris. On his return from the Continent he showed a marked predilection for the work of the pre-Raphaelite school, of which he was a profound admirer. This fact undoubtedly influenced the whole of his future work. In his views on art generally he was very broad-minded, and always aimed at seeing the good points in a fellow-artist's work, if such there were, rather than offering severe criticism, and he always welcomed honest criticism of his own work.

"During his professional career he painted over sixty portraits for presentation or otherwise, and amongst the former he was commissioned to paint a life-size portrait of the late Duke of Edinburgh, as Admiral of the Fleet, and by command of Queen Victoria attended at Osborne to show this portrait, which is now hung in the Royal Naval Barracks at Devonport. Of the many subject paintings from his brush perhaps the best remembered will be 'Cophetua's Queen,' 'Orpheus and Eurydice,' 'Pan and Syrinx,' and 'Silent Voices of the Studio.' But it will be principally by his religious pictures and mural decoration that his work will be remembered. His 'Magnificat,' exhibited in the New Gallery in 1894, is an exquisite conception, and his 'Ecce Ancilla Domini,' painted during the same year, is equally beautiful in its delicacy and composition. Both these pictures have been presented by Mr. C. Lang Huggins to Hadlow Down Church, Sussex. His picture, 'The Desire of all Nations,' exhibited at the Royal Academy in 1895, will probably be considered as his *chef d'œuvre*. This picture was purchased by the Rev. Harry Wilson for St. Augustine's Church, Stepney, where it now hangs, together with one of the most beautiful sets of the 'Stations of the Cross,' painted later by the same artist. It may be mentioned that the copyrights of both the 'Magnificat' and the picture last named were purchased by the Berlin Photographic Company in 1896, and subsequently reproduced in photogravure and widely circulated in all parts of the world. 'Christ before Pilate,' 'Christ's Entry into Jerusalem,' and 'St. Joseph's Dream,' are also amongst his most notable pictures. The first-named was exhibited in Paris, Berlin, and Dusseldorf. A second complete set of fourteen 'Stations of the Cross' was painted for the Rev. H. Eardley-Wilmot for St. Mary's Church, Ilford, together with three altar panels for the same church. The last altar panels painted by Mr. Prynne were for St. Mary's Church, East Grinstead, and represent the entombment of the Saviour, with adoring angels on each side, and his picture, 'Lux Mundi,' was the motif of the large sculptured panel in the reredos above.

"Space will not allow of the mention of the numerous other religious pictures, reredos subjects, wall paintings, altar panels, and designs for church windows (especially at St. Peter's Church, Staines, for Sir Edward Clarke, K.C.), many of which have been carried out in connection with churches designed by the artist's brother, Mr. G. H. Fellowes Prynne, F.R.I.B.A. But no notice of Mr. Fellowes Prynne's work would be complete without mention of his largest decorative scheme, carried out on the walls of St. Peter's Church, Plymouth, in memory of his father. In the decoration over the sanctuary arch has been depicted the Church Triumphant, with a vested Christ in glory surrounded by angels and hundreds of typical saints of the new and old dispensations. The painting, which is all in oil colours, covers a space of no less than 648 sq. ft., and had to be carried out in separate sections, pieced together. On the side walls immediately above the nave arcade are various subjects connected with the life of St. Peter, each covering a space of 73 sq. ft., and other pictures adorn the walls of the church. The last work Mr. Prynne was engaged upon was the completion of the four last 'Stations' of a set that he had been painting for the chapel of the Community of St. John the Evangelist, Oxford, and the last painting he touched was the 'Entombment of Christ.'

"Real religious painting of a devotional character has rarely received any encouragement in the art schools and academies of this country; consequently, the supply is comparatively small, and therefore it is hardly surprising that craving for art has drawn many to suppose that such work can only be obtained from the Continent, with the result that a vast amount of hopelessly inferior work, copies of the sacred pictures of the past and modern artists, are sent, commercially, to England and America for the so-called adornment of our churches. This spurious art can only have a debasing effect on the minds of beholders, and is utterly degrading to the higher branches of painting. The net result is that artists who are brave and enthusiastic enough to make religious art their life's work are handicapped in all directions, and only too often their high ideals fall before the absolute necessities of life.

"In private life Mr. Prynne was a very attractive character, and had the power of making and retaining the friendship of others. He was intensely fond of music, and, aided by Mrs. Prynne, constantly entertained friends in a charmingly informal manner, and there are many who will look back with mingled feelings of pleasure and regret on the delightful musical evenings spent in that interesting and altogether fascinating studio."

Mr. William S. Weatherley.

The death is announced, at the age of 71 years, of Mr. William S. Weatherley, F.R.I.B.A., of Buckingham-street, Strand, W.C., and Wandsworth Common. Deceased carried out a good deal of church building and restoration work, including the restoration and enlargement of St. Stephen's Church, Southwark (1891); a reredos at the Church of St. Botolph, Boston, Lincs. (1886); alterations to St. Mary's Church, East Leake (1886); the restoration of Shere Church, Surrey (1895); and a font cover, &c., at Loughborough Parish Church (1906). In the 'eighties he went into partnership with Mr. Francis E. Jones, and among the buildings and other work designed by the firm, were Avondale Hotel and Hatchard's Restaurant, Piccadilly (1884); restoration of Saundby Church, Gainsborough (1886); a building in Maddox-street, W., and St. Stephen's Church, Norbury. In 1888 the firm was awarded the first premium in the second competition for the Leathersellers' Company's Grammar School, and in 1887 gained the second premium in the competition for All Saints, Peterborough.

Mr. Thomas Hall.

Mr. Thomas Hall, senior partner of Messrs. Hall, Beddall & Co., builders, of London, died at his residence at Putney on December 26 last, aged 87. He was born at Leek, Staffordshire, and came to London in 1859, when he entered the office of Messrs. George Myers. In 1861 he went to Messrs. Mark Patrick & Son, and in 1866 he became chief estimator and surveyor to Messrs. William Lawrence & Son, of Pitfield Wharf, London. In 1880, Sir William Lawrence, Sir James Clarke Lawrence, and Mr. Edwin Lawrence (who later became Sir Edwin Durning-Lawrence) retired from business in favour of Mr. Hall and eight other members of their staff, and the firm of Hall, Beddall & Co. was founded. In 1909, all the partners except Mr. Hall having died or retired, Mr. George Perry Nash was taken by Mr. Hall as his partner, and has since had sole control of the business. Mr. Thomas Hall was well known in the trade, having been a member of the Council of the London Master Builders' Association, and served for many years on the Council of the Builders' Benevolent Institution. He was one of the four surviving members of the Builders' Society (now merged into The Institute of Builders), the remaining three being Mr. F. J. Dove, Mr. Frank May, and Mr. T. F. Rider.

MEETINGS.

FRIDAY, *January* 13.

London Society.—Lady Cooper on "The Banks of the Thames." At 18, John-street, W.C.2. 4.30 p.m.

College of Estate Management.—Mr. S. A. Smith on "Valuations." At 35, Lincoln's Inn-fields, W.C.2. 5.30 p.m.

MONDAY, *January* 16.

Architectural Association.—Mr. F. Hutchens on "Building in Sound." 8 p.m.

TUESDAY, *January* 17.

Royal Institute of British Architects.—Conference between Practice Committee and members on housing fees. At 9, Conduit-street, W.1. 3 p.m.

College of Estate Management.—Professor L. R. Dicksee on "Accounts and Business Organisation." 5.30 p.m.

WEDNESDAY, *January* 18.

London Society.—Dinner at Hotel Cecil. Baron Hayashi on "Impressions of London." 7.45 p.m.

L.C.C. Central School of Arts and Crafts.—Sir Banister Fletcher on "English Mediæval Architecture: Plans, Vaults and Buttresses." At Southampton-row, W.C.1. 6 p.m.

Industrial League and Council.—Mr. R. Young, O.B.E., M.P., on "Use and Abuse of Combines and Trusts." At Caxton Hall, S.W.1. 7 p.m.

THURSDAY, *January* 19.

College of Estate Management.—Professor S. D. Adshead on "Town Planning." 5.30 p.m.

Institution of Electrical Engineers.—Messrs. Haden & Whysall on "The Utilisation of Waste Heat from Electrical Generating Stations." At Savoy-place, W.C.2. 6 p.m.

Society of Antiquaries.—Mr. O. M. Dalton on "Two Engraved Bronze Bowls of the 12th Century," and Mr. S. Clarke on "Excavations at Fostat." At Burlington House, W.1.

Edinburgh Architectural Association.—Professor R. K. Hannay on "The Evolution of the Scottish Parliament and Court of Session." At 117, George-street. 7.30 p.m.

Manchester Society of Architects.—Sir L. Weaver on "Modern Domestic Architecture." At St. Mary's Parsonage. 6.15 p.m.

THE ELEMENTS AND THEORY OF ARCHITECTURE.—II.

BASED UPON THE FRENCH WORK OF M. GAUDET.

"DELINEATION"—"THE DIRECTING PRINCIPLES OF DESIGN."

BY T. P. BENNETT, F.R.I.B.A. (*Head of the Department of Architecture, Surveying, and Building, Northern Polytechnic*).

BEFORE an architect can attempt to design in the true sense of the word, he must have mastered the process of delineation. Architectural delineation, or descriptive geometry, is a science of accuracy and exactitude. It may be defined as a method of representing objects conventionally so that their size and form may be known and so that they may be reproduced, either to the same dimensions or to others proportionately larger or smaller. An architectural drawing is therefore the exact antithesis of the sketch. The latter aims at producing the general effect of a building or piece of ornament so that its appearance is indicated, generally in such a way that the drawing is itself of artistic value, giving light and shade, mass and appearance, rather than actual representation of the shapes and forms which produce these effects. The sketch gives the whole object in one *coup d'œil*.

Descriptive geometry requires at least three drawings to delineate one object, namely, plan, section, and elevation. In an architectural drawing it further requires a scale, so that lengths in feet and inches, or in metres and centimetres, may be known. Before the architect can properly design he must learn to compare accurately all such sizes with the human scale, and will allow the human scale to affect his work as much as the actual size and shape. A simple building may be completely described by means of one plan, one elevation, and one section; a complex building may require many drawings of each kind as well as innumerable details. Vaults and other surfaces may never be completely shown by simple geometric drawings, and may require "developed" drawings for their elucidation.

It is important that the designer should know whether he has completely defined a building or whether his drawings are incomplete. This is by no means so simple as it sounds, and often extreme care and great knowledge are necessary before it is possible to say with safety that a set of drawings gives the whole of the information required by the builder. It is essential, therefore, that the quality of realisation should be developed so that the architect may appreciate the way in which his surfaces will mature, how his plans and sections will combine with his elevation in producing actual effect. Many good designs have been ruined from imperfect realisation. To this end measured drawings are of great value to the student. By their means he works in the opposite way to the designer. He makes drawings of something already built. He produces or should produce an exact representation on paper of existing architectural forms, and so trains his eye and his mind to appreciate "realisation." To this end the sketch is also of value. The design produced in the atelier or office should be constantly connected with the actuality of executed work by means of sketches.

Rendered drawings hold an important place in helping towards the realisation of the third dimension. For that reason shadows are correctly drawn according to current custom at 45 degrees horizontally and vertically. It is a convention with an important object. A few comments on rendering may be of value. However much modelling there is in shadows their lightest parts will always be lower in tone than any portion of the high lights. Planes must be indicated; those near at hand having sharply defined lights and shadows, and, as distance increases, becoming less distinct, finally fading into one general grayness. Backgrounds should never be confused, the building always well defined, and focal points brought into evidence.

Design itself is, above all things, a work of great intelligence. Gaudet says: "An unintelligent man will never make a designer, neither will a man of light and superficial character; the study of design is noble and severe, and above all it is necessary, I repeat, that you should be convinced. Good design can only arise from long and accurate study. There are many elements in an architectural composition, and it is exceedingly difficult to weigh them all in the balance and give them their exact relative importance. It must be realised that architectural design cannot be applied indiscriminately and that success is dependent quite as much on suitability as on actual beauty or accuracy of detail.

Thus architecture involves, before all, the study of attendant conditions. Before design is attempted the salient features of the problem must be clearly grasped and be allowed to govern the whole composition. If the building is to be of a temporary nature such essentially practical points as speed of erection, maintenance, and degree of resistance to fire will affect the architectural treatment quite as much as the specification. In school buildings, ventilation, lighting, and economy will be forced into prominence; even the size of desk employed will affect the proportion of the elevation, and aspect will often govern the whole composition. In the great majority of buildings this insistence of the practical urges itself upon the designer, and he realises that abstract architectural composition is almost unknown.

In practice, therefore, the artistic expression of the architect is confined within the limits laid down by specific requirements, and he must exercise his art hampered (if such an expression be permissible) by the introduction of qualities of sound business judgment, practical requirements and common sense, qualities which are often said to be absent from an artistic personality. It is useless to design the most brilliant interior for a theatre if, to obtain effect, seats are sacrificed which prevent the theatre from giving an adequate return for money invested, or an hotel without sufficient bedrooms, however well proportioned the front or magnificent the public rooms. This information means the acquisition of extensive knowledge not merely of the requirements of the building but of the variations possible in designing its features, such as walls, roofs, doors, etc. It is also necessary to know the conditions attendant upon the employment of these features and their limitations. In studying them it is not sufficient merely to sketch; it is necessary to examine, measure, and dissect.

Design may be said to resolve itself into three subdivisions.

(1) The study of the elements of architecture; *i.e.*, the study of walls, doors, columns, arcades, and other features.

(2) The study of the elements of composition, Gaudet's definition being as follows:—"Composition is the construction of a work of art (*c'est la mise en œuvre*); it is the collection in one building of different features, which should themselves be known both as to their resources and their methods of employment before one has the pretention to compose, that is to say, to create a whole."

(3) The study of requirements. This is the most advanced stage of design, involving a knowledge of the evolution of the particular class of building to be designed, its present stage of development, and its salient advantages and disadvantages.

We are here mainly concerned with the study of the elements of architecture. But these elements must be studied with regard to their application to design and not merely as essays in archæology. The student of architecture must realise that his future as an artist and a designer as well as a practical man—in short, as an architect—depends very largely on the possession of knowledge.

It is important that the architect should know the origin of all the features he employs—only thus will he be able to design intelligently and develop his design logically and with interest. "Beauty," Plato has said in a magnificent definition, "is splendid truth." Art is the means given to men to produce the beautiful; art is then the pursuit of the beautiful in the truth. In the arts of imitation (painting and sculpture) truth is Nature. In architecture the truth is more difficult to define. Gaudet describes it as "conscience." He interprets this to mean the true expression of the requirements of the building; the influence of climate, the limitations of construction, and other elements dictating the conditions under which the buildings may be produced which are not themselves actually connected with design in the artistic sense. "Search then for this intimate and profound truth, this truth of conscience. You will thus protect yourselves from ephemeral success, from the tyranny of fashion, from the mirage of irrational imagination."

Ancient authors recognise three divisions in a work of architecture: (1) Disposition, which we interpret as composition. (2) Proportion, which is the outcome of study. (3) Construction, which is the control of study by science.

Composition cannot be taught. It is the result of many attempts, of the study of many examples; it is encouraged and developed by criticism and experience. Composition often comes by chance (if you like, by intuition), but we find composition growing out of study. Study directs the thoughts, shows that certain groupings develop from particular circumstances, that some arrangements are impracticable, and others satisfactory, thereby elucidating the final solution. Composition implies a power to reduce complicated requirements to their elements and to give them their true relative importance. This faculty is perhaps partly natural, but can be developed by study. To the perfecting of composition must come reason, knowledge, care, and correction.

In developing an architectural composition the first guide is the programme. The programme or conditions are properly the duty of the layman or user of the building, but often he is unconscious of his own precise requirements; his vague information is dangerous ground on which to build, and the architect therefore formulates the programme before he attempts the solution. This conscious statement of precise requirements is a necessary preliminary to good composition whether we are dealing with a properly constituted "competition" or a solution of a commission already given. But even a good programme can give no more than a collection of unrelated statements, and the architect must produce from this information, cohesion, proportion, effect, and the other qualities that make a fine design.

The relative importance of the programme must be realised. It is wrong to produce a miniature St. Paul's for a village church, or a cheap version of a Mayfair mansion as a suburban dwelling. By the true interpretation of relative importance we obtain "character."

There is one architecture which is suitable for the town, others for the country, for the palace, or for the cottage. A comparison of English and Italian Renaissance shows that climate has a serious effect on architectural treatment. Construction governs all our compositions. Design which ignores construction can never be perfect however great the intrinsic beauty which it may possess.

If our designs logically express their construction they are almost compelled to have the appearance of stability and repose, which are two of the great essentials of architecture. Astonishment is an uncomfortable permanent companion, and therefore any efforts of our own which depend for their effect upon their surprising skill are doomed to failure.

ARCHITECTURE AND THE PUBLIC.

AT a meeting of the Manchester Society of Architects, held on Wednesday last, MR. SAMUEL SMETHURST, Ex-President of the Institute of Builders, read a paper entitled "A Layman's View of Architecture."

He prefaced his address by saying he made no pretension to having any technical knowledge of architecture; he was free altogether from having any conscious predilection for any particular order or style. He saw beauty and greatness in the various styles, and was sometimes thankful he was saved from the fetish of those who saw nothing great except it were of the order they cherished and believed in. The real essence of beauty appertained to no particular style. It seemed to him that good architecture was not only beautiful, but given the same quality of labour and material it was with rare exceptions the cheapest. In Liverpool recently he was shown three buildings—two by one architect, and one by another. The two first buildings he had classified as "fair"; they had as features somewhat expensive ornament, and ranked with much that was only too common in English architecture. The third building was a factory of huge mass, and yet the architect, by fine proportions and almost perfect plainness, had succeeded in getting a really beautiful building of its class. The beauty in that case would endure as long as it existed. It seemed that much of the architect's work in the mid and later half of the past century was vitiated by an inordinate craving for ornament, which was piled on without rhyme or reason, and although always costly was invariably ugly. Happily, they were passing from that decadent period of national architecture.

It seemed to him that London was quickly becoming the finest capital city in Europe as regarded its architecture. There was a great deal more refinement in the detail of the French buildings, but as one gazed down boulevard after boulevard in Paris one was impressed with the same comparative flat surface, giving a monotonous effect relieved only now and again by such buildings as the Opera House and the Madeleine. It seemed that French architecture lacked the strength, variety and virility of the London thoroughfare. He had read adverse criticisms of the architecture of the Law Courts, but he thought as a matter of effective grouping it was very fine, and seen from the Strand on a bright moonlight night was a most enchanting building. It was precisely those effects that appealed to the ordinary citizen, and not whether it conformed with this or that standard of style. The man who had become a student of styles in architecture made criticisms in regard to details which ordinary men scarcely ever noticed; but a fine-proportioned building, nicely grouped, in harmony with its character and surroundings, never failed to make its appeal, and such buildings, although inanimate things, were always influencing for good those who were in contact with them.

Architecture had aspects other than the purely æsthetic. There was the practical side, a very real and important side, the one that was concerned with the utility of the building. If it were a truly good building it must serve in the highest degree the purpose for which it existed. The work of planning required gifts of a very high order, but the man who shone in that department often lacked the ability to design the really beautiful building, and so very often resorted to gaudy ornament to give a finish to his work. The real artist exercised the greatest restraint in the use of those things, which was a most difficult thing to do. The true secret of why there was so much building that was not good was that clients as a rule were more concerned about getting a man who could give a well planned and convenient building to enable them to carry on their business in the best way. They also appreciated the man with a strong commercial sense, who could see that they got value for their money. Such men were often men who also knew thoroughly the constructive side of building, and knew how to erect buildings which were safe for the work they had to do. A really great architect would have all those qualities, and so be complete—every age might produce a few such men. An ideal firm would be one which had principals skilled in the various sides of the profession—one should make the plan, be strong on construction, have a good commercial grasp of building, and then his colleague who could give form and life to the structure should begin to play his part; to get all he wanted it might be necessary to sacrifice some little of the utility, but that would always be done under the consciousness of the price that was being paid and a full knowledge of what one got for the sacrifice. He sometimes thought if he were a client and had an important building to build he would engage two architects, one a commercial utilitarian man who could give the best plan and construction, and a business sense in the execution of the work, and the other a man who could ensure fitness and beauty in the design. He did not think that would add to the cost materially, if at all, on the principle that it cost little to buy a few tubes of paint and brushes, a pallette and canvas, yet the product might be a picture of great value; and so that something which was indefinable but was in the soul of a man might arrange for the use of crude bricks, stone, timber, and other raw material of a building to be placed in such a way (yet at no more cost) that the resultant was a thing of beauty and an enduring monument for good through the ages.

To reduce what he had said to a definite formula, his idea of architecture was that every time an architect got a commission he had first to study the purpose for which the building was to be used, and go to any amount of trouble to ensure he had got the best possible result. He had to calculate his loads at different points of his structure, to see that he not only got a sufficient foundation but that the weight was equally distributed to avoid unequal settlement. Then the style must be decided. That, surely, must be influenced by the surroundings, and must harmonise with its surroundings. The architect must think not only of his own building, but of the group or street of which it formed a part, remembering always that he was helping to create a picture. If he was first in the field and was building alone, then he should visualise the street or square that was to be. He had some sympathy with the plan which he understood existed at Düsseldorf, where all the buildings on the main streets had to reach a certain standard and the municipality saw to it that no building should lower the standard of design in a particular street. That power would have to be guarded by a wide right of appeal to other and higher independent experts to prevent such a system from becoming mechanical and commonplace.

He had said that beauty was often more a question of good proportion and grouping than anything else. The height and the breadth of every part should be what it ought to be; the windows, and the panes within them, should answer also to this law; the roof, the chimneys, the break in line of the building, should all be restful, harmonising together to form a complete whole. What of ornament? It was a necessary part, but needed restraint in its use. Monumental buildings should have large and bold cornices, and nearly all buildings should have their plainness relieved by bands of suitable size and position. Doorways, pilasters, architraves (sometimes but sparingly) aprons, were all things with which the skilled architect juggled. Then there were the colour effects, which were important, depending upon surroundings and background which no real artist would neglect. As a builder he thought many who practised as architects needed to be reminded of even those elementary things.

He supposed for the past 80 years we had been the wealthiest nation in Europe. We had spent much money on buildings. Whose fault was it that we did not have better architecture? Was it that we lacked the men in the profession who could have shaped our building to higher ends? There was little doubt that during the last twenty or thirty years there had been a great advance. One heard of proposals for placing architects under some kind of legal sanction and registration. If something of the sort could be done it would entail a proper training and consequent examination before being allowed to practise, and the certificate to practise would be of value, as failure to conform to a good professional standard of conduct would result in being struck off the rolls. If there were a compulsory university training with definite courses of study, would there be better architects? He thought there would be, especially if a portion of the training consisted in giving them a knowledge of craftsmanship as well as the actual work in the office of a practising architect. He suggested that the examination ought not to be confined to the reproduction of a Classic building; he would rather see as the subject a modern building, such as a decent-sized house, a warehouse, church, chapel, town hall, baths, or shop—in a word, something of the kind that would engage their attention later in life in which they could begin to display their interest and awaken their ingenuity.

HOUSING AND TOWN-PLANNING NOTES.

Wakefield Town-Planning Scheme.

The Wakefield City Council has decided to prepare a town-planning scheme for the borough.

Ancient Town-Planning.

The first of a series of six lectures by Professor S. D. Adshead, M.A., F.R.I.B.A., was given at the College of Estate Management on January 5. In this lecture, dealing with town-planning of the ancients, he said there was no authentic case of conscious planning on other than a chessboard pattern in ancient times, and that that was the invariable plan of colonists throughout the world's history; it was explained by the fact that it facilitated the disposal of sites, and that convenience of traffic was of small account in new settlements. He went on to trace the social life of the Greek parent cities and their colonies and those of the Macedonian empire, dwelling especially on the planning of the Greek house, theatre, and gymnasium. After referring to the ancient lake settlements in northern Italy, he passed on to Rome and her colonies, showing how Rome consisted of magnificent palaces and public buildings and tumble-down tenements for the poorer people. The Roman *coloniæ* were settlements for the discharged soldiery and were planned on the lines of the Roman camp. The business life of the forum, the social life of the baths, the amusements at the theatre and amphitheatre, and the planning of the Roman house, were all described. On the lantern were shown photographs of excavations, such as those at Pompeii and Timgad, and drawings and plans representing ancient towns as they were in the old days.

Warwick Housing Scheme.

Considerable progress is being made with the Warwick housing scheme, which is being carried out by Messrs. B. Whitehouse & Sons, of Birmingham. Work was commenced on February 21, 1921, and progress up to December 31, 1921, was as follows:—The superstructure of 142 houses (including tiling) was completed; in 70 houses the plastering was completed; and 54 houses were completed (the majority being tenanted). During that time there was the coal strike, and 12 days taken as holidays. The total number of working hours was 1,892, which shows that the superstructure of the 142 houses was erected at the rate of one house in every 13 hours and 20 minutes, and in addition 70 houses were plastered and 54 completed and taken over for occupation.

The architects are Messrs. Crouch, Butler and Savage, FF.R.I.B.A., of Birmingham, and the clerks of works Messrs. Cashmore & Poulton

THE TOWN-PLANNING INSTITUTE.

PROFESSOR T. ADAMS presided at a meeting of the Town-Planning Institute, held on January 6, when Mr. G. L. Pepler introduced for discussion the subject of "Zoning."

MR. PEPLER said zoning was the term now generally used to denote the allocation of areas to the use (industrial, business, or residential) for which each was most suited. The waste and confusion of haphazard development and the consequent handicap to health and industry was so self-evident that it seemed incredible it had been allowed to go on so long. In England the first attempt at zoning was made in the Town-Planning Act of 1909. An important point to consider regarding zoning was the possible effect on land values. Reports from America showed that it had had the effect of stabilising values. He took it that the object they had in view was that their towns should be so planned and arranged that each function might be exercised as efficiently and economically as possible, with the minimum of friction and providing the maximum of health, happiness, and prosperity for the citizens. In order that that might be achieved, a necessary preliminary was that a scheme should be prepared allotting to each part of a town or region the function for which it was most suited. As a problem of town planning it seemed to resolve itself into this, that in deciding on what lines the development of the place should be guided the prime considerations must be how they could simplify and assist the carrying on of industry and at the same time preserve and improve health and amenities. The two main zones might therefore, perhaps, be headed: (1) industrial, (2) health. The general requirement in regard to an industrial zone was that the area allotted should be one where industry could be carried on most efficiently and economically, with adequate room for expansion, and without detriment to the home-life of the people. It must first be divided into (a) factory; (b) commercial, including offices and shops. The site requirements of a factory must be summarised as follows: (1) Good transport facilities, whether by rail, road or water; (2) proximity to sources of power, whether coal, gas, electricity, or water; (3) proximity to raw materials; (4) proximity to markets and exchanges; (5) suitable atmosphere; (6) suitable subsoil; (7) supply of suitable labour; (8) proximity to other interdependent factories. Offices and shops had different requirements, and as a rule their location would depend on the primary industrial and residential zones. In settling any zone, regard must be given not only to what was, but also to facilities that might be, provided as part of a town-planning scheme. The health zone would be located so that the homes of the people were within easy reach both of their places of employment and of recreation. That emphasised that zoning was only a part of town planning and could not be decided without reference to existing, and to the planning of future, means of intercommunication. The proper correlation of home and work places would save much waste of time, money, and effort in travel, but must have regard to amenity, and the houses must be placed so that they were free from noise and dirt. The requirements of the residents necessitated that shops should be handy, and also certain industrial undertakings, such as laundries, public garages, libraries, &c.; also the homes should be identified with the civic life of the place, and therefore in touch with the civic buildings, such as the town hall and libraries, and with the places of outdoor and indoor recreation. The essence of zoning was to keep a proper balance between the parts, always bearing in mind that industrial efficiency and economy depended just as much on good homes as on good workshops. They had next to consider how these principles should be applied and they must proceed with great caution and only after careful preliminary study and in close consultation with all interests affected, and all these schemes should be elastic. Discussing the question of the determination of the industrial zone, he said generally the reservation of exclusive industrial areas might be regarded as desirable wherever local conditions made that practicable, care being taken to allocate a sufficient number of such areas according to the size and requirements of the town; to see that the areas were of adequate extent to allow of development and expansion, as well as reasonable freedom of choice of site; and to avoid any artificial enhancement of land values through unwise restriction of such choice. Certain industrial undertakings, such as garages, bakeries, laundries, &c., directly served particular residential districts, and small areas should be reserved for them in reasonable proximity to those districts but so situated as not to interfere with the amenities. It might also be possible to admit to residential areas clean industries which did not produce smoke, fumes, dust, noise, or smell, and need not, therefore, affect amenity if placed in suitable locations by special consent. Warehouses, stores, and wholesale businesses, which acted as distributive agencies over a big radius should be situated centrally and near the railway yard, docks, wharves, or other depots for the receipt of incoming goods. There was the further question as to whether parts of industrial zones should be reserved for particular industries. Heavy industries required rail and water transport and solid ground; therefore, ought light industries, which really needed only road transport and perhaps less solid foundation, be allowed to take up sites essentially required for heavy industries? It should lead to industrial efficiency to group staple trades and subsidiary industries which served them or dealt with their by-products. Generally speaking, heavy industries were less susceptible to injury from other trades, and therefore the heavy zone could include offensive trades and alkali or similar works. On the other hand, some industries must have a clean atmosphere, and others engaged in delicate processes were injured by the proximity of works that caused vibration. At their present stage of experience it might be wisest to stick to broad classifications, providing for elasticity, subject to proper control.

It might be possible to select two exclusive zones, for areas that were particularly suitable for the purpose, one for residences and the other for factories, and the factory zone would probably be available for unlimited factory use. These exclusive zones were likely to be small. Other zones might be: (a) predominantly industrial, but with other buildings allowed by consent of the local authority; (b) predominantly residential, but with other buildings and industries allowed by consent and under conditions such as not to interfere with health or amenity. In addition, it might be desirable to reserve convenient sites for shopping centres and prominent sites for public buildings; also land specially suitable for use for open spaces, playgrounds, or allotments would need to be earmarked. Proper sites for minor zones, such as shopping centres, would, however, depend very largely on the ultimate site-planning to fill in the details of the outline town plan, and therefore in their case decision should, except in special instances, if possible, be left until the site planning took place, provided that it was done on comprehensive lines. As regarded the land surrounding the built-up core of a town, it would seem that pretty wide zoning powers were provided by the Town-Planning Acts.

PROFESSOR T. ADAMS said in America building regulations were not so well carried out as in England, and there was greater need for zoning to make up that defect. No city needed zoning more than London, and yet he doubted if they talked of applying the American system of zoning to residential areas of Bermondsey or Fulham whether they would carry conviction with those in authority. There was no question as to the need and practicability of zoning in all suburban areas like Southgate or Richmond, but it must be adapted to their conditions, and the object should be to raise the standards of the houses rather than to stereotype those they had. The simplest classification was best. Having regard to conditions in England they should apply zoning regulations negatively. The positive or creative side of town planning should be dealt with in constructive plans of development. There should be a general regulation in most districts preventing noxious and offensive industries. There should be areas in which anything might be permitted, as at present; other areas in which factories should be prevented; and a third in which factories and shops should be prevented. Indirectly the latter would be confined to residences. Hoardings and public garages should be specifically regulated in the first two areas and prevented in the third. They should have no districts defined as "unrestricted." While an area might be unrestricted as to use it should be restricted as to density and height of buildings. There could be no doubt that where zoning was properly applied it would appreciate land values, or at least prevent their depreciation. Too much emphasis could not be placed on the need for making zoning a part of the general development plan dealing with communications, parks, &c.

MR. F. ELGOOD, F.R.I.B.A., said one of the great defects felt at the present time was the want of legislation in regard to including built-up areas. Any zoning plan attempted in London could not possibly leave out of account the necessity for the separation or the elimination to a large extent of dwelling-house accommodation where it was in close proximity to factory buildings. He was inclined to think that rigidity in town planning if it were carried very far was calculated to wreck the whole of the principles.

MR. RAYMOND UNWIN, F.R.I.B.A., said the unstable condition of values in America was due largely to the checker-board system of planning. He agreed that in certain cases they would have to have mixed areas, but he felt it was essential that every individual part of the extended town should be planned so that room was reserved for the expansion of each part without encroaching on another part. The reservation of areas for a particular use was the essential part of the constructive plan of the town or area.

PROFESSOR S. D. ADSHEAD asked them to keep before them the great danger of attempting to over-regulate the future destiny of towns. He thought that in attempting zoning they would run great danger of giving way to the wishes of local authorities and of persons with influence in the towns. They must be strong and firm in attempting to do the best for every area, having regard to the broad natural topographical conditions which existed. They would make a great mistake if they attempted at first a too great sub-division of industries. They should go slow at first and sub-divide the industries as later experience suggested.

MR. GIBBON (Ministry of Health) said he advised town planners at the present time to emphasise the economic side of the question. He did not agree that zoning should be negative. Important as technical qualifications were, he thought the big social questions had to be determined before the town plan could be determined. He suggested that in the discussions on this matter they should invite business men to be present. He was amazed to find how little it seemed to be appreciated that so far as the inter-town plan needs were concerned zoning was essential for their determination. The Ministry of Health had had to deal with these actual problems, and plans were being actually made and decisions had to be made. There ought to be a strong public opinion on which the Government department could rely, but it did not exist.

MR. ELFORD (Borough Surveyor, Cardiff) said he was dealing with a scheme involving about 20,000 acres, and found that zoning was about the most thorny subject he ever struck. It did not seem zoning could be effective unless it dealt in some measure with built-up areas and enabled a restriction to be placed on the continuous expansion of houses on sites which ought to be used for industrial purposes. Similarly, there ought not to be encroachment by industries on residential areas.

THE BUILDING TRADE.

STRENGTHS OF WALLS AND FLOORS.

Strengths of Walls and Floors.

Two reports embodying the results of investigations of the Building Materials Research Committee (which preceded the present Building Research Board) have been published, namely, "The Stability of Thin Walls," and "Experiments on Floors" (London: H.M. Stationery Office, price 6d. net and 1s. 3d. net each respectively).

Walls.

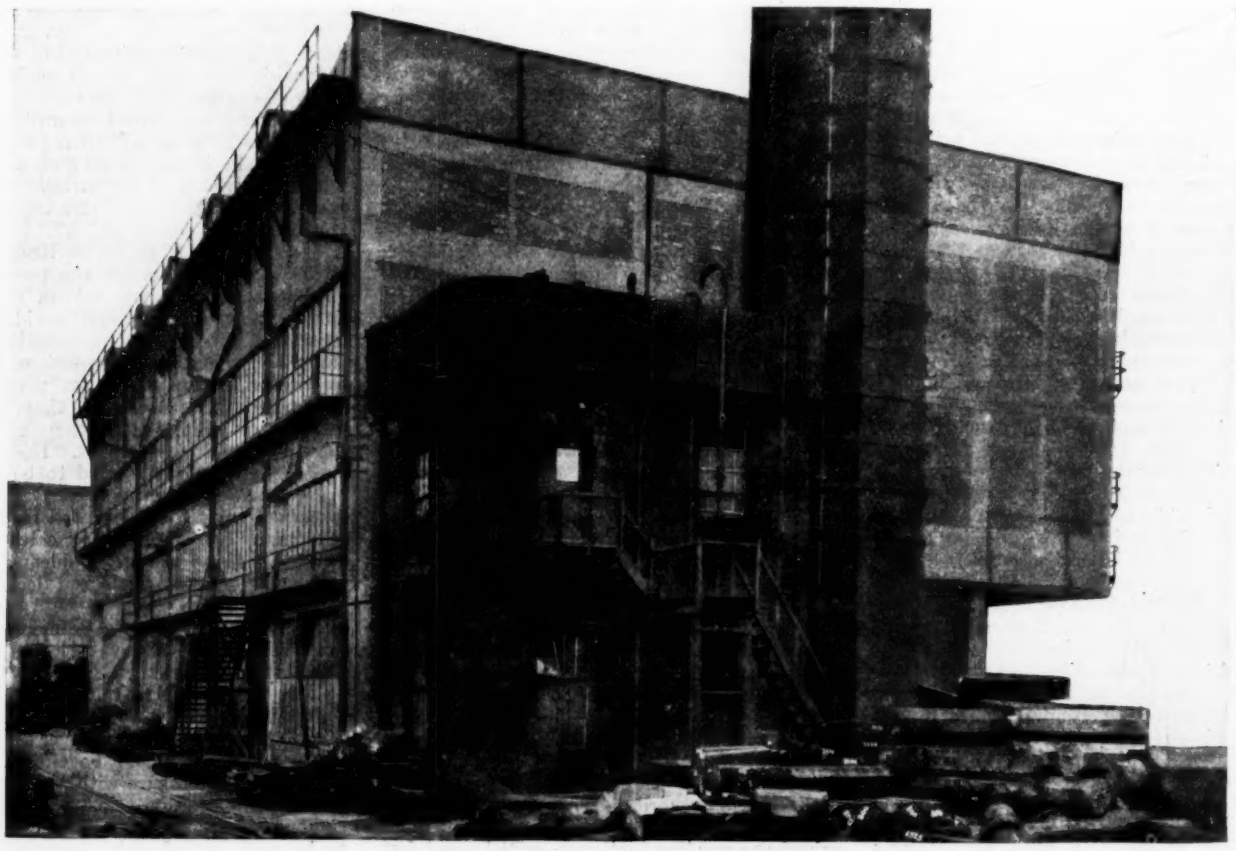
The investigation of the stability of thin walls was carried out by Dr. Oscar Faber, who, in an appendix to the report, says the tests show that brickwork in 3 to 1 mortar is stronger than brickwork in 6 to 1 mortar in the ratio of 100 to 88 in the case of stocks and 100 to 89 in the case of Flettons, which are very consistent results. They indicate that brickwork set in 3 to 1 lime mortar is only about one-third as strong as brickwork in cement mortar when used for long, slender specimens, although when tested in short cubes it may show as much as 80 per cent. of the strength of brickwork in cement. The reason of this is that in a short cube the mortar may crush to a powder and is still capable of resisting compression, whereas in a long column, once this crushing has taken place, the column fails by buckling.

The tests indicate clearly the great strength of even 6 to 1 concrete mixed wet in comparison with brickwork, the average of the two concrete columns being 1,370 lb. per sq. in. as against 700 lb. per sq. in. the average of the five brickwork specimens, *i.e.*, approximately double.

Tests of single bricks showed that hard burnt stocks crushed at about 1,460 lb. per sq. in., and soft burnt stocks at about 760 lb. per sq. in.—approximately one-half. The cubes of stock bricks in cement correspond to the strength of the weaker bricks of which they were composed. In the case of Fletton bricks the strength of the brick was 3,300 lb. per sq. in., somewhat over twice the strength of the cubes made from these bricks.

Experiments were made on walls 3 ft. 6 in. long, 4½ in. wide, 8 ft. 6 in. high, supported vertically in the testing machine between steel joints and felt, and a load of 2 tons per foot run in the case of stock bricks in 3 to 1 cement mortar and 1 ton per foot run in the case of the remaining specimens was put on the machine. This load gives stresses of 82 and 41 lb. per sq. in., which are only a small fraction of what the specimens would safely carry, but which were intended to represent approximately the vertical load which might be considered as coming on a wall when used for cottage construction owing to the weight of the wall above and the proportion of the floor load which it might have to carry. A horizontal load was then applied at the centre of the wall. The results give surprisingly high values, and when it is remembered that a single concentrated load at the centre would produce approximately the same bending stresses as twice this load uniformly distributed it will be seen that in the case of brickwork in cement mortar the equivalent horizontal load per sq. foot producing fracture is of the order of 50 lb. per sq. ft., and in the case of brickwork in lime mortar approximately half this figure. In the case of the concrete specimen the figure is approximately 75 lb. per sq. ft. The ratio of the strength of brickwork in lime mortar to that of brickwork in cement mortar in bending is approximately the same as that they bear to one another in the case of compressive strength of the long columns. The thin bending specimen deflected from ⅜ in. to 1½ in. before failure took place. The concrete consisted of four parts clean ¾ in. crushed ballast, two parts clean sand, one part slow setting Portland cement.

A further series of tests was made on five types of wall as follows:—(1) Fletton bricks on edge (2⅝ ins. thick), (2) coke breeze blocks (3 ins. thick), (3) coke breeze blocks (4 ins. thick), (4) 6 to 1 concrete blocks made in a "Winget" machine (4½ ins. thick), (5) 6 to 1 concrete blocks wet mixed (3 ins. thick). In all cases 3 to 1 cement mortar was used between the bricks or blocks, and they were tested at about 23 days old. The result for Fletton bricks was 3,500 lbs. per sq. in., which agrees very well with that obtained in the first series of 3,300 lbs. per sq. in. The strength of 1,240 lbs. per sq. in. for the wet mixed concrete blocks is probably low owing to the face being irregular as the specimen was cut from a larger slab, and the figure of 1,630 as shown by the 6-in. cube of the same material is probably a fairer test. While Fletton bricks are stronger than good concrete, cubes made of Fletton bricks in 3 to 1 cement mortar are slightly inferior in strength to concrete cubes. The concrete blocks made dry in a machine gave only 743 lbs. per sq. in., though the blocks were about four months old, and the actual tests on the walls made with these blocks gave similarly low results of 580 lbs. per square inch. The coke breeze slabs are very weak. As to the crushing strengths of the walls, the wet mixed concrete and Fletton bricks both gave about ½-ton to the sq. in. Comparing these with corresponding tests on specimens 4½ in. thick, it is seen that the reduction in thickness has not reduced the strength at all in the case of the Fletton brick, but that in the case of the concrete walls it has reduced the strengths from 1,510 to 1,130. In all probability if several specimens of both kinds had been made it would have been found that there was a reduction in both cases of about 15 per cent., and the great strength of these very flimsy specimens in compression is remarkable. If the strength per sq. in. of the long specimens is compared with the corresponding strength per sq. in. of the same material in the form of cubes, the reduction in strength resulting



Engineers' Repair Shop at Sheffield. (*See p.* 89)

from the specimen being 8 ft. 6 ins. long and only 3 in. wide is very small and much smaller than would have been expected. The horizontal force diminishes approximately in proportion to the thickness of the wall, not in proportion to the square on the thickness, as might have been expected. Thus, in the Fletton wall, the 3 to 1, 4-in. specimen gave 781 lbs. Multiplying this by $2\frac{5}{8}$ and dividing by $4\frac{1}{2}$, gives 456; and the actual value found was 553. In the case of the concrete blocks the $4\frac{1}{2}$-in. walls gave 1,253. Multiplying this by 3 and dividing by $4\frac{1}{2}$, it would give 835, while the actual value was found to be 700. The first of these is rather less, the second more.

The report contains some valuable tables, in which the results of the experiments are fully set out.

Floors.

In the experiments on floors, the following types were tested:—(*a*) Hollow tile, (*b*) perforated brick and tile, (*c*) hollow tile, (*d*) reinforced concrete beams and slab, (*e*) wood, (*f*) reinforced concrete beams and slab, (*g*) hollow tile [similar to (*c*)], (*h*) ash concrete beams.

From the tables included in the report, it is seen that the curves for the composite floors are all in agreement with those usually obtained in tests of reinforced concrete, when deflection is plotted against load, which usually exhibit a want of proportionality between deflection and load even for stresses corresponding to those below the yield point of the steel reinforcement. The strongest floor would appear to be floor (*f*), which was reinforced in both directions. This floor is one of the heaviest and contains a comparatively large proportion of steel. The next in order appears to be the wooden floor which would probably have stood even greater loads had there not been a hidden defect in the beam which actually failed. As, however, the defect in the broken beam had not been detected before the floor was erected it would not appear desirable to look upon the wooden floor as having a greater breaking strength than that actually experienced. Floor (*h*) failed under a very small load. This was apparently due to the material from which the concrete was made. It would not appear to be desirable to adopt this concrete for floors likely to be loaded to 56 lbs. per square ft. unless a considerably higher factor of safety were adopted. The results of the test on floor (*h*) have not been analysed on the basis of the concrete analogy since the ratio between the elasticities of ash concrete and steel is unknown and possibly differs widely from that usually taken for stone or ballast concrete. The use of ash or breeze concrete seems, therefore, undesirable unless a higher factor of safety is adopted. It is apparent that the proper supporting of the "units" during construction is a matter of more importance to the ultimate strength of the floor than is generally appreciated. In all cases, the beams composing such floors should rest on one or more temporary supports, which should be left in place until the whole of the floor has been grouted up and allowed time to set. If this precaution is not taken and the strength of the detached units is depended upon for support during the finishing stages of construction, the ultimate margin of safety in the floor may be very materially reduced.

The tests were satisfactory in that they generally supported the view that considerable reliance can be placed on composite floors constructed of bricks or tiles with reinforcement of steel. Ordinary rules for determining the amount of steel and the strength of floors constructed of bricks and tiles should, however, be applied with caution and used as rough guides only.

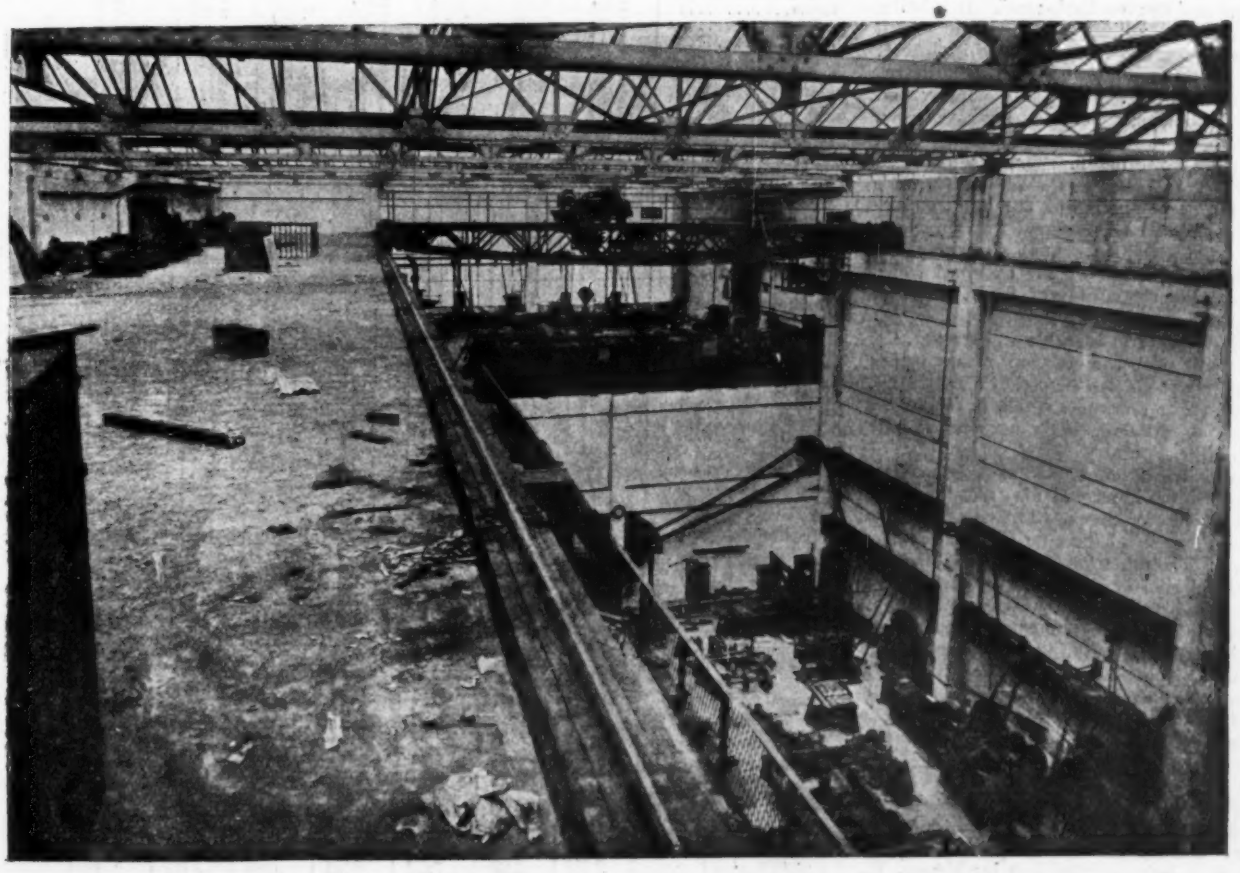
All the types of floor tested except floor (*h*) are suitable for small cottage property and can be looked upon as reasonably reliable in use, but this is contingent upon care being taken in the design of the floors to secure that the thickness and reinforcement are properly adapted to the spans required in the houses in which it is proposed to use them, and that adequate supervision is given during construction. In some cases, it may be found that such floors form an alternative to timber at a price slightly exceeding the latter. It should, however, be noted that they have obvious advantages in their capacity to resist fire and vermin, that they are not subject to dry rot, and that they help to tie the building together in a more efficient manner than does the ordinary floor.

This report gives complete accounts of the manufacture and testing of each of the samples, and the shapes and sizes of the test pieces, together with the results of the tests, are clearly set out in the form of diagrams and curves.

ENGINEERS' REPAIR SHOP AT SHEFFIELD.

THE new engineers' repair shop at Messrs. Thos. Firth & Sons' West Gun Works, Sheffield, contains several points of interest to owners of engineering works as well as to designers. This was one of the buildings erected during the war and urgently wanted for war purposes. Heavy machines working in the neighbourhood caused a great deal of vibration which could be felt in the building while in progress of construction. The pouring of the concrete for the main parts was, therefore, carried out when those machines were at rest. This precaution was sufficient to prevent any harm to the reinforced concrete work, although the machines were started again as soon as the concrete had its initial set.

The building is 138 ft. long by 73 ft. wide. On one side it is open from ground floor to roof for a space of 90 ft. by 47 ft. 6 in. and 47 ft. high to eaves, this portion forming a crane well of which the ground floor is the mechanics' shop. On the other side of the ground floor is the plumbers' shop, 90 ft. by 25 ft. 6 in. At 90 ft. from the front the ground floor is divided by an internal wall, taken up 25 ft. to first-floor level. The remaining portion of the ground floor, 48 ft. long by 73 ft. wide, which is isolated from the main building, forms the boiler house, over which is the electricians' shop. A roof of constructional steelwork spanning about 71 ft. between outside concrete columns covers the building from front to back. Over the plumbers' shop are three galleries running the entire length at heights of 15 ft., 25 ft., and 40 ft. respectively. The second of these galleries is at the same level as, and connects with, the electricians' shop. The first and second galleries are 33 ft. wide, 10 ft. of which is cantilevered into the crane well. On the first gallery are offices and stores, the second is devoted to general stores, and the end portion over the boiler house contains the electrical stores for the adjacent electricians'



Engineers' Repair Shop at Sheffield.

shop. A crane travels the entire length of the building for a width of 47 ft. 6 in., thus traversing the whole of the open part of the ground floor, the cantilevered portion of the second gallery and the electricians' shop at the end of the building.

The suspended floors and galleries are designed for a superimposed load of 4 cwts. per sq. ft., and, as the end floor is carried over a span of 47 ft., beams of considerable size are employed. The outer main beams here are 66 in. deep by 14 in. wide; the main beam on line with the interior columns which, in addition to carrying the floor load, picks up at its centre a supporting column to the crane track, is 84 in. deep by 22 in. wide.

The columns at the east side of the building measure 52 ft. 6 in. in length from the top of the base to the eaves level, carrying the crane beams at 40 ft. from the ground, and are then taken up to support the roof trusses. They are 30 in. by 20 in. in cross sectional area. To ensure their stability the bases measure 12 ft. by 4 ft. 6 in.

The contractors for the building were Messrs. Thos. Wilkinson & Son, Sheffield. Messrs. Firth's own engineering and architectural staffs were responsible for the general planning of the building, the working drawings being prepared by the Trussed Concrete Steel Co., Ltd., on the "Kahn" system of reinforcement. "Kahn Rib" bars were used for reinforcing the structure throughout.

NEW BUILDINGS IN LONDON.

TOTTENHAM.—The premises on the corner of High-road and West Green-road are being reconstructed as a new branch of the London Joint City and Midland Bank, Ltd. The work is being carried out by Messrs. Courtney & Fairbairn, Ltd., builders and contractors, of 377, Albany-road, Camberwell, S.E. The architect is Mr. T. B. Whinney, of 8, Old Jewry, E.C. The window openings, &c., are by Messrs. Meakins. The building is one of two floors in brick construction with stone facings.

STAMFORD HILL.—A new motor garage is now in course of erection on a site having frontages in High-road and Craven Park-road. It is being built for Mr. F. J. Rudling, of 51A, Hillside-road, N.15. The plans, drawn up by the architect, Mr. C. A. Marques, of Brimsdown, Middlesex, provide for a two-story building constructed with concrete blocks, contracted for by Messrs. Concrete Manufacturers (No. 1 London), Ltd., of Brimsdown, Middlesex. There will be a number of lock-up garages for cars at the rear of the building, and including the main garage accommodation will be provided for about 100 cars. A commencement has already been made with the erection of the external walls. Sub-contracts for the supply of steelwork, &c., have not yet been settled.

ROTHERHITHE.—Considerable progress has now been made with the erection of new works and offices for the British Electric Co., at 25-29, Lower-road. The contract, which is estimated to cost about £10,000, is being carried out entirely by the Foundry Construction Co., of Birmingham. Brick construction is being employed, and the builders will also construct the reinforced concrete floors. The architect is Mr. Victor S. Peel, of Temple Chambers, Birmingham. It is understood that the British Electric Co. is shortly getting out a new set of friction hoists for the use of builders.

WALTON-ON-THAMES.—Some progress has now been made with the building operations being carried out at the branch of Messrs. Barclay's Bank, Ltd., situated in High-street on the corner of Ashley-road. The work has been the entire reconstruction of the whole of the inside of the domestic quarters for the bank manager and the enlargement of the bank premises, which has necessitated a considerable amount of constructional work inside; all new mahogany fittings are to be provided. The entire work is being carried out by Messrs. W. H. Gaze & Sons, Ltd., of 23, High-street, Kingston-on-Thames. The architect is Mr. W. Ralph Low, of 67, Basinghall-street, E.C.

RATES OF WAGES IN THE BUILDING TRADE.

The following are the rates of wages in the building trade in England and Wales. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur:—

	Masons.	Bricklayers.	Carpenters, Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Masons' Labourers.	Bricklayers' Labourers.	Plasterers' Labourers.
Aberdare	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Accrington	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/-			1/7½
Altrincham	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Ashton-under-Lyne	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Barnsley	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Barrow-in-Furness	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Barry	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Bath	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½			1/5
Bedford	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Birkenhead	2/2	2/2	2/2	2/2	2/2	2/2	2/2			1/9½
Birmingham	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Bishop Auckland	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Blackburn	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Blackpool	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Bolton	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Bournemouth	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Bradford	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Bridgwater	1/7	1/7	1/7	1/7	1/7	1/7	1/7			1/3
Brighton	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Bristol	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Burnley	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Burton-on-Trent	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Bury	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Cambridge	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Cardiff	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Chatham	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½			1/3½
Chelmsford	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Cheltenham	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½			1/5
Chester	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Chesterfield	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Colchester	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Coventry	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Crewe	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Darlington	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Derby	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Doncaster	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Dudley	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Durham	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
East Glam. and Mon. Valleys	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Exeter	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/7½			1/4
Folkestone	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½			1/3½
Gloucester	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½			1/5
Grantham	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Grays	2/0½	2/0½	2/0½	2/0½	2/0½	2/1	1/11½			1/7½
Grimsby	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Great Yarmouth	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½			1/3½
Guildford	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Halifax	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Harrogate	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Hartlepools	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Hastings	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½			1/3½
Hereford	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/8½			1/5
Huddersfield	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Hull	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Ipswich	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Lancaster	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Leamington Spa	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Leeds	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Leicester	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Lichfield	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Lincoln	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Liverpool	2/2	2/2	2/2	2/2	2/2	2/2	2/2			1/9½
Llanelly	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
London	2/0½	2/0½	2/0½	2/0½	2/0½	2/1	1/11½			1/7½
Loughborough	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Luton	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Maidstone	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½			1/3½
Manchester	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Mansfield	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Merthyr Tydfil	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Middlesbrough	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Newcastle-on-Tyne	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Newport, Mon.	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Northampton	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Norwich	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Nottingham	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Oakham	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½	1/9½			1/5
Oldham	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Oxford	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Plymouth	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/9½			1/6
Pontypridd	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Portsmouth	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Preston	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Reading	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Rochdale	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Rochester	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½	1/7½			1/3½
Rugby	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
St. Albans	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
St. Helen's	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Scarborough	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Sheffield	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Shrewsbury	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Southampton	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Southend-on-Sea	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Southport	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
South Shields	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Stockport	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Stockton-on-Tees	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Stoke-on-Trent	2/-	2/-	2/-	2/-	2/-	1/11	2/-			1/7
Stroud	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8			1/4
Sunderland	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Swansea	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Taunton	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Torquay	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Tunbridge Wells	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/4
Wakefield	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Walsall	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
Warrington	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
West Bromwich	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/7½
Wigan	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/4
Windsor	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½	1/8½			1/7½
Wolverhampton	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½			1/6
Worcester	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6
York	1/11	1/11	1/11	1/11	1/11	1/11	1/11			1/6

(For rates of wages in the Building Trade in Scotland, see page 91.)

CONTRACTS, COMPETITIONS, &c.

For some contracts still open, but not included in this List, see previous issues. Those with an asterisk are advertised in this number. Certain conditions beyond those given in the following information are imposed in some cases, such as that advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in; the name and address at the end is the person from whom or place where quantities, forms of tender, &c., may be obtained.

BUILDING AND PAINTING.

✱JANUARY 14.—**Belgium.**—CEMETERY CONSTRUCTION.—**Fifth Programme of Construction, consisting of approximately 14 cemeteries in Belgium, for the Imperial War Graves Commission. Contract 1921E, Secretary (Works Dept.), Imperial War Graves Commission, 82, Baker-street, London, W.1.**

JANUARY 14.—**Bridlington.**—COTTAGES.—**Erection of four cottages and buildings on Wilsthorpe Estate, Carnsley, near Bridlington, for the East Riding C.C. County Land Agent, County Hall, Beverley.**

JANUARY 14.—**Harrogate.**—BOILER HOUSE.—**Building boiler house, at the Gas Works, Ripon-road, for the Harrogate Gas Co. Mr. Frank H. Robinson, Engineer, Gas Office, James-street, Harrogate.**

JANUARY 16.—**Blackpool.**—PAINTING.—For exterior painting at South Shore Branch Reading Room and Municipal Gymnasium, for the T.C. Mr. F. Wood, Surveyor, Municipal Buildings, Blackpool.

JANUARY 16.—**Cardiff.**—PAVILION.—**Competitive designs and tenders for the supply and erection of a concert pavilion in Llandaff Fields, for the T.C. Mr. E. J. Elford, City Engineer, Cardiff. Deposit £2 2s.**

✱JANUARY 16.—**Lynton, N. Devon.**—REDECORATION AND ALTERATION.—Redecoration and alteration of Valley of Rocks Hotel for Spiers & Pond, Ltd. Mr. J. G. Martin, A.R.I.B.A., 38A, New Bridge-street, E.C.4.

JANUARY 16.—**Ramsgate.**—ADAPTATION.—**For partial adaptation of Chatham House for use by County School for Boys, for the Kent E.C. Mr. W. H. Robinson, Architect, Sessions House, Maidstone. Deposit £2.**

JANUARY 16.—**Sheffield.**—PAINTING.—For internal painting at the Firth Park Secondary School (Brushes House), and the Annexe (Abbeyfield House), for the T.C. Mr. F. E. P. Edwards, City Architect, Town Hall, Sheffield.

JANUARY 17.—**Brighton.**—PAINTING.—For painting, &c., the parochial offices, Prince's-street, for the Board of Guardians. Mr. E. Wallis Long, architect, 56, East-street, Brighton.

JANUARY 17.—**Cardiff.**—HOUSES.—Finishings of 24 semi-detached concrete houses at Ely, for the T.C. Mr. E. J. Elford, City Architect, City Hall, Cardiff. Deposit £2 2s.

JANUARY 17.—**Eyeworth.**—SCHOOL.—Erection and equipment of semi(permanent buildings for the higher grade department of Eyemouth Public School, for the E.A. Mr. R. Muir Lang, Clerk to School Management Committee, Church-street, Eyemouth.

JANUARY 17.—**Glasgow.**—INSTITUTE.—Completion of the Couper Institute, Cathcart, for the T.C. Office of Public Works, City Chambers, 64, Cochrane-street, Glasgow.

JANUARY 17.—**Llantarnam.**—HOUSES.—Erection of 10 houses on the Two Locks-road Site, Cwmbran, for the U.D.C. Mr. A. Gordon Jones, Surveyor, Council Offices, Cwmbran. Deposit £2 2s.

JANUARY 17.—**Southampton.**—BRIDGES.—Reconstruction of Wickham (South) and Kitnocks Bridges, for the C.C. Mr. W. J. Taylor, County Surveyor, The Castle, Winchester. Deposit £2 2s.

JANUARY 17.—**Tottenham.**—MATERIALS.—Supply to the U.D.C. of wood-blocks and lime and cement, for three or six months. Mr. Reginald C. Graves, Clerk, Town Hall, Tottenham, N.15.

JANUARY 17.—**Tredegar.**—BUNGALOW.—Erection of a bungalow at the Nantybwch Waterworks, for the U.D.C. Mr. D. Walter Davies, Gas and Water Department, Manager's Office, Tredegar.

JANUARY 18.—**France and Belgium.**—HEADSTONES.—**The Imperial War Graves Commission invite tenders for a total supply of 6,500 headstones. Secretary, Works Dept., Imperial War Graves Commission, 82, Baker-street, London, W.1.**

JANUARY 18.—**Fulham.**—EXTENSION.—**For extension of the Generating Station at Townmead-road, for the Metropolitan Borough of Fulham. The Town Clerk, Town Hall, Fulham, S.W.6. Deposit £10.**

JANUARY 18.—**Grimsby.**—HOUSES.—**Erection of 50 houses, for the T.C. Mr. J. W. Jackson, Town Clerk, Municipal Buildings, Grimsby. Deposit £2.**

JANUARY 18.—**Polruan-by-Fowey.**—BUNGALOW.—Erection of seven-roomed bungalow. Mr. C. W. Parkes Lees, architect, Fowey.

January 18.—**Wandsworth.**—PAINTING.—For decorative work at 38 and 40, St. Ann's-hill, Wandsworth, for the Board of Guardians. Mr. F. J. Curtis, Clerk, Union Offices, St. John's-hill, Wandsworth, S.W.18.

JANUARY 19.—**Beeston.**—HOUSES.—**Erection of 14 non-parlour (7 pairs) and 2 parlour (1 pair) houses, for the U.D.C. Surveyor, Public Offices Beeston, Nottingham. Deposit £2 2s.**

JANUARY 19.—**Edinburgh.**—SLATING.—For the slater work of the electric sub-stations at Gorgie and Morningside, for the T.C. Mr. James A. Williamson, City Architect, Public Works Office, City Chambers, Edinburgh.

JANUARY 20.—**Middlesex**—HOUSES.—**Erection of (1) 46 houses, &c., at Yiewsley, Middlesex; (2) roads and sewers in connection therewith, for the Commissioners of His Majesty's Office of Works. Contracts Branch, King Charles-street, London, S.W.1. Deposit £1 1s.**

JANUARY 20.—**Nottingham.**—HOUSES.—Erection of 18 houses, for the T.C. Housing Department, Trinity-square, Nottingham. Deposit £1 1s.

JANUARY 20.—**Yiewsley.**—HOUSES.—Erection of (1) 46 houses, &c., at Yiewsley, Middlesex; (2) roads and sewers in connection therewith, for H.M. Office of Works. Contracts Branch, H.M Office of Works, King Charles-street, London, S.W.1. Deposit £1 1s.

JANUARY 21.—**Wakefield.**—CONVERSION.—Conversion of Thornes House into a Secondary School, for the T.C. Mr. Percy Glover, Director of Education, Education Department, Town Hall, Wakefield.

JANUARY 23.—**Barking.**—HOUSES.—Erection of 40 or 80 houses, for the U.D.C. Mr. C. J. Dawson, architect, Clock House Chambers, East-street, Barking. Deposit £2.

JANUARY 23.—**Tadcaster.**—HOUSES.—Erection of Houses on the following sites: Allerton Bywater (22), Kippax (6), for the R.D.C. Messrs. Jones & Stocks, architects, 56, Prudential-buildings, Leeds.

JANUARY 23.—**Wokingham.**—ADDITIONS.—Erection of additional wards to Female Block of Union, for the Board of Guardians. Mr. P. H Phipps, Clerk, Union Offices, Board Room, Barkham-road, Wokingham. Deposit £2.

JANUARY 23.—**Wokingham.**—HOSPITAL WARD.—Erection of an additional ward to Infirm Block, for the Board of Guardians. Mr. P. H. Phipps, Clerk, Union Offices, Board Room, Barkham-road, Wokingham.

JANUARY 24.—**Bridgwater.**—SHOW BUILDINGS.—**Erection of showyard buildings, &c., for show to be held at Bridgwater in May, 1922, for the Somerset County Agricultural Association. Mr. Harold O. Samson, 1, Hammet-street, Taunton.**

JANUARY 24.—**Gloucester.**—BUILDING.—Erection of a Telephone Exchange at Gloucester, for the Commissioners of His Majesty's Office of Works. Contracts Branch, King Charles-street, London, S.W.1. **Deposit £1 1s.**

✱JANUARY 25.—**Bethnal Green.**—ADAPTATION AND EXTENSION.—Adaptation and extension of a building at Bethnal House, Bethnal Green, for the use as a Public Library for the Metropolitan Borough Council of Bethnal Green. Engineer and Surveyor, Town Hall, Cambridge-road, Bethnal Green, E.2. Deposit £2 2s.

JANUARY 25—**Bristol.**—OFFICES.—Construction of new administrative offices at the Avonmouth Docks, for the Docks Committee. Mr. Thomas A. Peace, Engineer's Office, Avonmouth Docks. Deposit, 3.

JANUARY 25.—**Wandsworth, S.W.18.**—HOUSES.—**(a) Erection of 82 non-parlour houses on the Watney Estate, Southfield, in groups comprising respectively 24, 28, and 30 houses; (b) 68 non-parlour houses on the Furzedown Estate, Tooting, in groups comprising respectively 14 and 54 houses. Watney Estate: Mr. G. L. Elkington, Norfolk House, 7, Laurence Pountney-hill, Cannon-street, E.C.4; Furzedown Estate: Mr. H. B. Elkington, Norfolk House, 7, Laurence Pountney-hill, Cannon-street, E.C.4. Deposit £2 2s. in respect of each estate.**

✱JANUARY 26.—**Ashford, Middlesex.**—ALTERATION AND ADDITION.—Alteration and addition to provide Assistant Superintendent's quarters, for the managers of the West London District School. Mr. H. Dighton Pearson, 59, Berners-street, W.1.

JANUARY 26.—**Castleford.**—SCHOOL.—Erection of technical and evening schools at Castleford, for the West Riding E.C. Education Architect, County Hall, Wakefield.

JANUARY 26.—**Mexborough.**—SCHOOL.—Erection of Technical Evening School at Mexborough, for the West Riding E.C. West Riding Education Architect, County Hall, Wakefield.

JANUARY 28.—**Abertillery.**—HOUSES.—**Erection of 24 houses on the Rose Heyworth housing site, for the Urban District Council. Council's Engineer and Surveyor, at the Council Offices, Abertillery. Deposit £2 2s.**

✱JANUARY 30.—**Gillingham, Kent.**—BUILDING.—Erection of a Secondary School for 200 boys at Gillingham in the County of Kent, for the Education Committee. County Education Architect, Room 69, Sessions House, Maidstone. Deposit £2.

JANUARY 30.—**Newlyn West.**—SCHOOL.—Erection of a new Council School at Newlyn West, for the Cornwall C.C. Mr. F. G. Drewitt, architect, Lennard's Chambers, Penzance. Deposit £1 1s.

JANUARY 31.—**Buckhaven.**—MEMORIAL.—For statue and bronze panels for war memorial, for the Burgh of Buckhaven, Liethil, and Innerleven. Mr. Robert Leslie, Town Clerk, Hon. Secretary, Municipal Buildings Buckhaven. Deposit £1 1s.

JANUARY 31.—**Gretna.**—REPAIRS.—**For repairs at the parish church and manse. Mr. E. Tweedie, architect, 43, Lady-street, Annan.**

NO SALE.—**Whickham.**—HOUSES.—Erection of two houses, for the U.D.C. Mr. T. Lambert, Clerk, Town Hall, Gateshead-on-Tyne.

FURNITURE, MATERIALS, etc.

JANUARY 14.—**Egypt.**—PAINTS, &c.—Supply of oils, paints, and varnishes to the Director of Stores, Frontier Districts Administration, Alexandria. Department of Overseas Trade, 35, Old Queen-street, S.W.

JANUARY 14.—**Winchester.**—TAR.—Supply of tar for use on roads for one year, to the Southampton C.C. Mr. W. J. Taylor, County Surveyor, The Castle, Winchester.

JANUARY 16.—**Bootle.**—MATERIALS.—Supply to the Corporation of (*a*) Kerbs (granite, gritstone, concrete or other approved; (*b*) channels; (*c*) concrete flags. Borough Engineer, Town Hall, Bootle.

JANUARY 16.—**London.**—FURNITURE.—Supply to the Metropolitan Asylums Board of furniture (cabinet work, bentwood and other chairs), for two sanatoria. Office of the Board, Embankment, London, E.C.4.

JANUARY 17.—**Bootle.**—KERBS, CHANNELS, CONCRETE FLAGS.—Supply of materials—(*a*) Kerbs—granite, grit stone, concrete, or other approved; (*b*) channels; (*c*) concrete flags, for the County B.C. of Bootle. Borough Engineer, Town Hall, Bootle.

JANUARY 18.—**Egypt.**—TIMBER.—Supply of timber to the Director of Stores, Frontier Districts Administration, Alexandria. Department of Overseas Trade, 35, Old Queen-street, S.W.

BUILDING TRADE WAGES IN SCOTLAND.*

THE following are the present rates of wages in the building trade in the principal towns of Scotland. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur:—

	Masons.	Bricklayers.	Carpenters, Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Masons' Bricklayers' Labourers.	Plasterers'
Aberdeen	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/7	1/5½ to 1/6½	
Airdrie	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½	
Alexandria	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½	
Arbroath	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/5½	
Ayr	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/1	1/5½	
Bathgate	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	1/5½	1/5½ to 1/6½	
Blairgowrie	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	—	—	
Bo'ness	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/-	1/8	
Coatbridge	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½	
Dumbarton	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	1/9	1/7½	
Dumfries	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/7½	1/6 to 1/7	
Dundee	2/0½	2/0½	2/0½	2/0½	2/0½	2/4	1/9	1/7½	
Dunfermline	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½	
Duns	1/9	1/9	1/9	1/9	1/9	1/9	1/6	1/3 to 1/4	
Edinburgh	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½	
Falkirk	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½	
Fort William	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	—	1/5	
Galashiels	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	—	—	
Glasgow	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/1	1/7½	
Greenock	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	1/9	1/4½ to 1/7½	
Hamilton	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	1/9	1/7½	
Hawick	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/8	1/3½	
Helensburgh	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½	
Inverness	1/11½	—	1/11	1/11	1/11½	1/11	1/11	1/0 to 1/3†	
Kilmarnock	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/1	1/7	
Kirkcaldy	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/6½	
Kirkwall	1/9	1/9	1/9	1/9	1/9	1/9	—	1/2	
Lanark	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7	
Motherwell	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½	
Perth	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	1/9	1/7½†	
Stirling	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	1/7½	
Stirlingshire (Eastern District)	2/0½	2/0½	2/0½	2/0½	2/0½	2/4	2/1	1/7½	
Wishaw	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½	

* The information given in this table is copyright. The rates of wages in the various towns in England and Wales are given on page 90.

† Under unemployment relief scheme. 11d

JANUARY 13.—**France and Belgium.**—HEADSTONES.—For the total supply of 6,500 headstones, packed and delivered f.o.b., to be divided into a number of contracts, none of which shall be for less than 100 headstones. The Secretary, Works Department, Imperial War Graves Commission, 82, Baker-street, London, W.1.

JANUARY 18.—**Holland.**—MATERIALS.—Supply to the Department of the Colonies of the Netherlands of materials, including 147,000 kilogs. of bricks, and paint materials. Department of Overseas Trade, 35, Old Queen-street, S.W.

JANUARY 18.—**Manchester.**—STORES.—Supply to the Directors of the Manchester Ship Canal Co. of stores required during the six months ending July 31, 1922. Stores Department, Manchester Docks, Trafford-road, Salford.

JANUARY 19.—**Guildford.**—DESKS.—Supply of twelve desks for the Corn Exchange, for the T.C. Borough Surveyor, Tuns Gate, Guildford.

JANUARY 20.—**Derby.**—ROAD MATERIALS.—Supply to the Derbyshire C.C. of tarmacadam, granite and basalt, iron furnace slag, limestone, refined tar and pitch. Mr. J. W. Horton, County Surveyor, St. Mary's Gate, Derby.

JANUARY 20.—**Wandsworth.**—MATERIALS.—Supply of disinfectants, granite (broken), &c., to the B.C. Mr. D. A. Nicholl, Town Clerk, Council House, Wandsworth, S.W.18.

JANUARY 21.—**Edinburgh.**—SAND.—Supply of about 1,500 tons of clean, sharp, filtering sand at Alnwickhill, Torduff, or Glencorse filters, for the T.C. Messrs. J. & A. Leslie & Reid, engineers, 29, Waterloo-place, Edinburgh. Deposit £5.

JANUARY 22.—**Southend-on-Sea.**—RETORTS.—Supply of retorts, firebricks, &c., for the Gas Department. Mr. M. E. Bradford, Manager, Gasworks, Leigh-on-Sea.

JANUARY 23.—**Madras.**—STONEWARE PIPES.—Supply of 58 miles of stoneware pipes and specials varying from 4 in. to 18 in. Messrs. J. Mansergh & Sons, agents for the Madras Corporation, 5, Victoria-street, Westminster, S.W.

JANUARY 24.—**London, S.W.1.**—LAVATORY FITTINGS.—(1) Supply of pedestal closets; (2) urinals; (3) lavatory basins and sinks; (4) water waste preventor cisterns; (5) w.c. seats. Contracts Branch, H.M. Office of Works, London, S.W.1.

✱JANUARY 25.—**Chelsea.**—ARTICLES AND WORKS.—Supply and execution of various articles and works, from April 1, 1922, to March 31, 1923, for the Metropolitan Borough Council of Chelsea. Mr. T. W. E. Higgins, the Borough Surveyor, Town Hall, King's-road, Chelsea, S.W.3. Deposit £10 Bank of England Note.

JANUARY 25.—**Exeter.**—MATERIALS.—Supply of road stone, refined tar, lubricating oils, surface tarring, &c., to the Devon C.C. Mr. F. E. Simpson, County Surveyor, 17, Bedford-circus, Exeter.

JANUARY 25.—**Ipswich.**—MATERIALS.—Road and other materials, for the East Suffolk C.C. Mr. W. Jervis, County Road Surveyor, County Hall, Ipswich.

JANUARY 25.—**Johannesburg.**—CREOSOTE.—Supply of 45 tons of creosote in steel drums to the Manchester Council. Department of Overseas Trade, 35, Old Queen-street, S.W.

JANUARY 25.—**London.**—TOOLS, &C.—Supply to the East Indian Railway Co. of miscellaneous tools and stores. Mr. G. E. Lillie, Nicholas-lane, London, E.C.4. Charge £1 1s.

JANUARY 27.—**West Ham.**—MATERIALS.—Supply of road and other materials to the B.C. Borough Engineer, Town Hall, West Ham, E.

JANUARY 28.—**Chelmsford.**—MATERIALS.—Supply of road materials to the Highways Committee of the Essex C.C. Mr. Percy J. Sheldon, surveyor, Old Court, Chelmsford.

JANUARY 28.—**Egypt.**—MATERIALS.—Supply to the Director of Public Health, Cairo, of hardware, oils and paints, &c. Department of Overseas Trade, 35, Old Queen-street, S.W.

JANUARY 29.—**Peterborough.**—ROAD MATERIALS.—Supply of granite, tarmacadam, slag, &c., to the Stoke of Peterborough C.C. Mr. H. Russell, County Surveyor, 45, Priestgate, Peterborough.

JANUARY 30.—**Hatfield.**—ROAD MATERIALS.—Supply to the Herts C.C. of broken granite, slag, and tar macadam. Mr. A. E. Prescott, County Surveyor, Hatfield.

ENGINEERING, IRON AND STEEL.

JANUARY 14.—**Manchester.**—ENGINE AND WEIGHBRIDGE.—(a) Saddle-tank, 4-wheeled coupled steam locomotive, 3 ft. gauge, (b) 20-ton weighbridge. Secretary, Rivers Department, Town Hall, Manchester.

JANUARY 16.—**Belgium.**—CANAL.—Construction of new channel from the Scheldt to the Docks at Antwerp. Department of Overseas Trade, 35, Old Queen-street, S.W.

JANUARY 16.—**Dublin.**—PIPES, &C.—Supply to the T.C. of cast-iron pipes, valves, castings, and other necessary fittings required for the Valve Tower of the new reservoir at Roundwood, Co. Wicklow. Borough Surveyor, 28, Castle-street, Dublin. Deposit £1.

JANUARY 16.—**Eccles.**—SALVAGE PLANT.—Supply and erection of a tins and waste metal scrap baling plant, for the T.C. Mr. G. W. Willis, Sewage Disposal Works, Peel Green-road, Patricroft.

JANUARY 16.—**Edmonton.**—TUBES, &C.—Supply to the U.D.C. of steel tubes, cast-iron pipes and sluice and disc valves. Mr. Cuthbert Brown, Surveyor, Town Hall, Edmonton, N.9.

JANUARY 16.—**Glasgow.**—ELECTRIC LIGHTING.—Electric lighting installation of the Craigton Housing scheme, for the T.C. Mr. R. B. Mitchell, Electrical Engineer, 75, Waterloo-street, Glasgow.

JANUARY 16.—**Glasgow.**—FENCING.—Erection of wrought-iron railings and gates in connection with the Greenhead Housing scheme, Govan, for the T.C. Mr. J. Lindsay, Town Clerk, City Chambers, Glasgow.

JANUARY 16.—**Margate.**—CESSPOOL EMPTYING APPARATUS.—Supply of cesspool emptying apparatus (steam or petrol driven), including engine, pump, suction pipes, &c. Mr. Ernest A. Borg, Water Engineer, 13, Grosvenor-place, Margate.

JANUARY 17.—**London.**—RAILWAY STORES.—Supply to the Great Indian Peninsula Railway Co. of spare parts of carriages, copper plates, bolts, nuts, canvases, &c. Mr. E. H. Walpole, Secretary, 48, Copthall-avenue, E.C.

JANUARY 17.—**Wallasey.**—GAS PLANT.—Supply of purifiers at Gasworks. Mr. J. H. Crowther, Gasworks, Limekiln-lane, Wallasey.

JANUARY 18.—**Edinburgh.**—PIPES.—Supply of 50 tons of cast-iron branches, bends, &c., 18 in. to 24 in., internal diameter in accordance with the British Standard Specification, to the T.C. Messrs. J. & A. Leslie & Reid, engineers, 29, Waterloo-place, Edinburgh. Deposit £5.

JANUARY 18.—**London.**—WATER PLANT.—Supply to the Metropolitan Water Board of Lancashire boilers, superheater, piping and feed pumps at Deptford, S.E.3. Mr. Henry E. Stilgoe, Chief Engineer, 173, Rosebery-avenue, E.C.1. Deposit £1 1s.

JANUARY 19.—**Edinburgh.**—ELECTRIC INSTALLATION.—Electric lighting installation of the Public Wash-house, Causewayside, for the T.C. Mr. Frank A. Newington, Engineer, Electricity Supply Offices, Dewar-place, Edinburgh. Deposit, £1 1s.

JANUARY 19.—**Edinburgh.**—PENNAGE.—Additional pennage to entrance to Sale Ring and in open space outside same, at the Cattle Market, Gorgie, for the T.C. Mr. James A. Williamson, City Architect, Public Works Office, City Chambers, Edinburgh.

JANUARY 20.—**Kettering.**—WATERWORKS.—(1) Construction of service reservoir at Corby; (2) 127 tons of cast-iron pipes; (3) 20 sluice valves; (4) oil engine and pumps, for the R.D.C. Messrs. Pick, Everard & Keay, engineers, 6, Millstone-lane, Leicester. Deposit £2 2s each contract.

JANUARY 20.—**London.**—RAILWAY MATERIALS.—Supply to the Bombay, Baroda and Central India Railway Co. of boilers, files, picks, grinding wheels, &c. Mr. S. G. Young, Secretary, White Mansion, 91, Petty France, S.W. Charge, £1 for boiler specification and 10s. each for others.

JANUARY 20.—**New Romney.**—IRON RAILINGS.—Erection of about 280 yards of iron railings at the Burial Ground, New Romney, for the T.C. Mr. W. Lamacraft, Town Clerk, Town Hall, New Romney, Kent.

JANUARY 21.—**Sheffield.**—PLATELAYING MATERIAL.—Supply of points, crossings, fishplates, tiebars, copper bonds, to the Tramways Committee. Mr. W. J. Hadfield, City Surveyor, Town Hall, Sheffield. Deposit £1 1s.

JANUARY 22.—**Southend-on-Sea.**—RETORTS.—Supply of retorts, firebricks, &c., to the Gas Department of the T.C. Mr. M. E. Bradford, Manager, Gas Works, Southend-on-Sea.

JANUARY 23.—**London.**—RAILWAY MATERIAL.—Supply to the Bengal & North-Western Railway Co. of 1,200 volute springs, and 550 C. & W. Tyres. Mr. E. A. Neville, Managing Director, 237, Gresham House, Old Broad-street, London, E.C.2. Charge 10s. each.

JANUARY 24.—**London.**—RAILWAY MATERIAL.—Supply to the High Commissioner for India of copper bolts and galvanised iron chain. Director-General, India Store Dept., Belvedere-road, Lambeth, S.E.

JANUARY 25.—**Mold.**—STONEBREAKER, &C.—Supply of stonebreaker, screens and engine to the Flintshire C.C. Mr. R. G. Whitley, County Surveyor, County Buildings, Mold.

JANUARY 26.—**Southampton.**—DREDGING.—Dredging works, viz., (1) Enlargement of the swinging ground off Southampton Docks; and (2) widening of the deep-water channel near North Thorn Buoy in the Solent, for the Southampton Harbour Board. Mr. E. Cooper Poole, Harbour Offices, Town Quay, Southampton. Deposit £1.

JANUARY 28.—**Newport (Salop).**—WATERWORKS.—Erection of engine-house and pumping plant, &c., at Lilleshall Water Works, for the R.D.C. Messrs. Berrington, Son & Wathey, engineers, Prudential Chambers, Wolverhampton. Deposit £2 2s.

JANUARY 30.—**Sunderland.**—CONCRETE TANK.—Construction of a mass concrete gasholder tank, 127 ft. 6 in. dia. by 25 ft. 8 in. deep, for the Sunderland Gas Co. Mr. C. D. Drury, engineer, Hendon Gas Works, Sunderland. Deposit £2 2s.

JANUARY 31.—**London.**—RAILWAY MATERIAL.—Supply to the High Commissioner for India of wrought-iron buffers and engine turntables. Director-General, India Store Department, Belvedere-road, Lambeth, S.E.

FEBRUARY 1.—**London.**—METERS.—Supply to the Metropolitan Water Board of the up-stream and throat sections, pressure piping, float pipes, apparati, recorders, &c., for three Venturi meters. Mr. Henry E. Stilgoe, Chief Engineer, 173, Rosebery-avenue, Clerkenwell, E.C.1.

FEBRUARY 1.—**Siam.**—RAILWAY MATERIAL.—Supply to the Siam State Railways of 500 pairs wheels and axles. Messrs. C. P. Sandberg, 40, Grosvenor-gardens, London, S.W.1. Charge £1.

FEBRUARY 6.—**Bethnal Green.**—HOT WATER SUPPLY.—Installation of a central hot water supply at the Hospital, Cambridge-road, E.2, of the Board of Guardians. Mr. C. Faulkner Jones, Clerk, Administrative Offices, Bishop's-road, Bethnal Green, E.2. Deposit £3.

FEBRUARY 6.—**Camberwell.**—TELEPHONES.—For maintenance of private telephones and electric bells at public buildings of the B.C. Borough Engineer, Town Hall, Camberwell.

FEBRUARY 7.—**New Jersey.**—TUNNELS.—Construction of two cast-iron tunnels under the Hudson River from New York to Jersey City. Department of Overseas Trade, 35, Old Queen-street, S.W.

FEBRUARY 9.—**Manchester.**—AQUEDUCT.—Laying and jointing of 54-inch welded steel and other pipes, the fixing of valves and ironwork, the construction of subways under railways, &c., connected with the fourth pipe line from Thirlmere to Manchester, as follows: (*a*) Ambleside to South of Kendal (about 8½ miles); (*b*) Kirkby Lonsdale to Lancaster (about 8½ miles); (*c*) South of Lancaster to River Ribble (about 4½ miles) (*d*) River Ribble to Horwich (about 6½ miles). Secretary, Waterworks Offices, Town Hall, Manchester. Deposit, £5 5s. each contract.

FEBRUARY 10.—**Johannesburg.**—WATER METERS.—Supply to the T.C. of 1,200 ¾ in. meters. Dept. of Overseas Trade, 35, Old Queen-street, S.W.

FEBRUARY 13.—**Middleton.**—TAR-SPRAYING MACHINE.—Supply to the T.C. of (1) one horse-drawn tar-spraying machine; and (2) 20 street sand bins. Mr. J. P. Walmsley, Town Clerk, Town Hall, Middleton, Lancashire.

FEBRUARY 15.—**Australia.**—PIG-IRON BREAKER.—Supply to the Victorian Railway Commissioners of hydraulic pig-iron breaker, including tools, gears, accessories and spares (for Bendigo workshops). Dept. of Overseas Trade, 35, Old Queen-street, S.W.

FEBRUARY 15.—**Australia.**—TELEPHONE APPARATUS.—Supply of telephone apparatus and parts to the Deputy Postmaster-General, Brisbane. Dept. of Overseas Trade, 35, Old Queen-street, S.W.

NO DATE.—**Barnoldswick.**—CRANE.—Supply and erection of a steam travelling crane, with 40 ft. jib, to handle loads up to 2 tons, and fixing of 80 ft. of rails, for the U.D.C. Mr. J. W. Thompson, Engineer and Manager, Barnoldswick.

ROAD, SANITARY, AND WATER WORKS.

JANUARY 14.—**Headington.**—WATER SUPPLY.—For carrying out water scheme at Garsington, for the R.D.C. Mr. A. Walker, Surveyor, Hill Crest, Windmill-road, Headington.

JANUARY 16.—**Baildon.**—SEWER.—Sewering of the Lane End district, with approximately 218 yards of 9 in. and 6 in. pipe sewer, &c., for the U.D.C. Mr. C. E. Bean, surveyor, Council Offices, Baildon. Deposit £1 1s.

JANUARY 16.—**Eastbourne.**—SEWER.—For laying about 470 yards of pipe sewer, and 576 yards of concrete tubes for surface water sewer, for the T.C. Compton Estate Office, Eastbourne. Deposit £2 2s.

JANUARY 16.—**Plymouth.**—STREET WORKS.—Street cleaning and watering and collection of trade refuse in various districts, for the T.C. Mr. T. Peirson Frank, Borough Engineer, Borough Engineer's Office, Plymouth.

JANUARY 17.—**Musselburgh.**—SEWERAGE WORKS.—Construction of new outfall and intercepting pipe sewers, extending to about 2¼ miles, varying in diameter from 30 in. to 9 in., for the T.C. Mr. G. Somervel Carfrae, Engineer, 1, Erskine-place, Edinburgh. Deposit £1.

JANUARY 17.—**Sevenoaks.**—SEWER.—Extension of the sewer in Sandy-lane, Chipstead, in the parishes of Chevening and Riverhead, for the R.D.C. The works will comprise the laying of 1,232 of 6 in. stoneware pipe sewers, including concrete for 402 ft., construction of manholes, &c. Mr. J. N. Prior, No. 1, The Paddock, Westerham. Deposit £2 2s.

JANUARY 18.—**Beddington.**—ROADS.—Tarspraying 300,000 sq. yards of roads during 1922, for the U.D.C. Mr. S. F. R. Carter, Surveyor, Council Offices, Wallington, Surrey.

JANUARY 18.—**Chadderton.**—ROAD.—For construction of road in detail, for the U.D.C. Messrs. J. Diggle & Son, engineers, 14, Brown-street, Manchester. Deposit £5.

JANUARY 18.—**London.**—SEWERS.—Construction of a 36-in. diameter relief culvert, about 1 mile long and between 12 and 21 ft. deep, with appurtenant manholes, &c., and passing under three railways, for the T.C. Messrs. Elliott & Brown, engineers, Burton Buildings, Parliament-street, Nottingham. Deposit, £5 5s.

JANUARY 18.—**Southwell.**—WATER SUPPLY.—Supplying and laying of about 2½ miles of 3 in. cast-iron water mains for the parishes of Staythorpe and Rolleston, for the U.D.C. Messrs. Sands & Walker, engineers, Milton Chambers, Nottingham. Deposit £2 2s.

JANUARY 18.—**Southwell.**—WATER MAINS.—Supplying and laying of about half-mile of 3 in. cast-iron water mains in Wellow, for the R.D.C. Messrs. Sands & Walker, engineers, Milton Chambers, Nottingham. Deposit £1 1s.

JANUARY 19.—**Hexham.**—SEWERAGE WORKS.—Laying of about 3,200 lineal yards of sewer with sanitary pipes in sizes varying from 6 to 9 inches, and construction of sedimentation tanks and filters, at Acomb, for the R.D.C. Mr. A. S. Dinning, Engineer, 21, Ellison-place, Newcastle-upon-Tyne.

JANUARY 19.—**Lambeth.**—REFUSE DISPOSAL.—For supply of wharf or jetty and the barging away therefrom and disposal of house and other refuse; Mr. H. E. Anderson, Borough Engineer, Lambeth Town Hall, Brixton Hill, S.W.2.

JANUARY 19.—**Sutton Coldfield.**—DRAINAGE, &C.—For surface water drainage and fencing in Tamworth-road, for the T.C. Mr. W. A. H. Clarry, Borough Surveyor, Council House, Sutton Coldfield. Deposit £1.

JANUARY 20.—**Kettering.**—For the construction of waterworks for the Parish of Corby, for the R.D.C. Messrs. Pick, Everard & Keay, Engineers, 6, Millstone-lane, Leicester.

JANUARY 20.—**Manchester.**—ROADS.—Making up streets, for the T.C. Paving, &c., Department (District Surveyor's Office), Town Hall, Manchester. Deposit, £1 1s.

JANUARY 20.—**Portsmouth.**—WATER MAINS.—Laying, jointing and testing of about 1,200 yds. of 42 in. cast-iron straight pipes and bends, for the T.C. Mr. G. Midgley Taylor, engineer, 36, Victoria-street, Westminster, S.W.1. Deposit, £5.

JANUARY 21.—**Dartford.**—SEWERAGE WORKS.—The time for receipt of tenders for an extension of the main outfall works at Dartford for the West Kent Main Sewerage Board has been extended to above date. Mr. S. R. Lowcock, engineer, 6, Queen Anne's Gate, Westminster, S.W. Deposit £5.

JANUARY 21.—**Holmfirth.**—SANITARY.—Night soil removal, for the U.D.C. Mr. A. Percy Buscoe, Clerk, Holmfirth.

JANUARY 23.—**Caerphilly.**—STEEL WORKS.—For street works at High-street, Nelson, for the U.D.C. Mr. T. H. Richards, Surveyor, Caerphilly. Deposit £1 1s.

JANUARY 23.—**Caerphilly.**—SEWER.—Construction of 1,000 yards of 9 in. sewer at Ystrad Mynach, for the U.D.C. Mr. T. H. Richards, Surveyor, Caerphilly. Deposit £2 2s.

*JANUARY 23.—**Willesden, London, N.W.**—WOOD AND ASPHALTE PAVING.—Laying 5,500 yards super or thereabouts of wood paving in certain thoroughfares in the District of Willesden; also 2,000 yards super or thereabouts of asphalte paving for the Willesden District Council. Mr. F. Wilkinson, Engineer to the Council, Town Hall, Dyne-road, Kilburn, N.W.6.

JANUARY 26.—**Salford.**—ROADS.—Making up streets in connection with the housing schemes of the Corporation. Borough Engineer, Town Hall, Salford.

JANUARY 28.—**Sutherland.**—ROADS.—Reconstruction of three portions of County roads, at Borgie, Rheanlairg, and Oykel, for the C.C. Mr. Archd. Argo, Clerk, County Clerk's Office, Golspie.

*JANUARY 30.—**Harpenden (Herts).**—SEWERING, DRAINING, KERBING AND CHANNELLING.—Sewering, draining, kerbing, channelling and making-up of Station-road, Harpenden, from Cowper-road to the Great Northern Railway (approximately half-a-mile in length), for the U.D.C. Mr. John H. Leverton, Surveyor, Public Hall, Harpenden. Deposit, £2 2s.

JANUARY 30.—**North Riding of Yorkshire.**—Supply of road stone and tar for tar-spraying for main roads in the North Riding, for the C.C. County Surveyor, County Hall, Northallerton.

FEBRUARY 1.—**Abingdon.**—WATER SUPPLY.—Works in connection with the water supply for Sutton Courtenay, for the R.D.C. Mr. Guthrie Allsebrook, F.G.S., 29, Crown-street, Reading. Charge, £2 2s.

FEBRUARY 6.—**Camberwell.**—DUST REMOVAL.—For removal of street refuse, &c., for the B.C. Borough Engineer, Town Hall, Camberwell.

FEBRUARY 6.—**Stratford-on-Avon.**—WATER SUPPLY.—For sinking borehole and supplying pumping plant, for the T.C. Mr. F. W. Jones, Borough Engineer, Stratford-on-Avon. Deposit £2 2s.

FEBRUARY 8.—**Middleton.**—SEWER.—Sewering of Hartley-street, Middleton, for the T.C. Borough Engineer, Town Hall, Middleton.

Competitions.

(*See Competition News, page* 68.)

Auction Sales, Tenders, etc.

*JANUARY 17.—**Gospel Oak.**—Messrs. Veryard & Yates will sell (without reserve), at 103A, Mansfield-road, Gospel Oak, a large quantity of capital timber and building materials. Auctioneers: 365, Norwood-road, S.E. 27.

JANUARY 17.—**Wittering, Northamptonshire.**—Messrs. Richardson will sell, by direction of the Disposal Board, at Wittering Aerodrome, Northamptonshire, adjoining the Great North-road (2 miles from Stamford, Mid., G.N. and L. & N.W. Railways, 9 miles from Peterborough), the whole of the brick and timber frame buildings. Auctioneers, 15, Barn Hill, Stamford and Bourne.

*JANUARY 18.—**St. Albans.**—Messrs. Hubert & Flint (in conjunction with Messrs. Gray, Phillips & Co., Ltd.) will sell in consequence of the premises being sold at 49-63, Heath-road, St. Albans, joiner's machinery and stock office furniture and fittings, the property of the Herts Joinery Co. Auctioneers, Watford, Herts, and 11, Searle-street, Lincoln's Inn, W.C.2.

JANUARY 24.—**Cambridgeshire.**—Barrington, Cambridgeshire (by order of the Senior Official Receiver and Liquidator), in the matter of the Dreadnought Portland Cement Co., Ltd., freehold land and buildings known as The Dreadnought Portland Cement Works, with an area of about 151¼ acres, connected with Foxton Station (G.E. Rly.) by light railway about 1¼ miles in length. Particulars, Robinson & Roods, surveyors, 37, Bedford-row, W.C.1.

JANUARY 24.—**Marston Thrift, Bedfordshire.**—Messrs. Joseph Hibbard & Sons will sell by Order of the Controller, Timber Disposal Department, Board of Trade, at the Depot, Woodend (2 miles from Marston Mortaine Station, L. & N.W. Rly.), stock of timber, plant and rolling stock, including 15,000 ft. cube round oak butts, portable engines, machinery, shafting, &c. Auctioneers, 15, Newington Green, Islington, London, N.16.

JANUARY 25.—**Ealing, W.**—Messrs. Knight, Frank & Rutley will offer for sale, as a whole or in lots (unless previously sold privately), freehold factory site, with about 688 feet frontage to Pope's-lane, the whole extending to an area of about 9¼ acres, situate about 10 minutes from Acton Town and South Ealing Stations. Auctioneers, 20, Hanover-square, W.1.

FEBRUARY 2 AND 3.—**Liverpool.**—Messrs. George N. Dixon & Co. will sell, by order of the Housing Committee of the Liverpool Corporation, at the Edge-lane Depot, and the Edge-lane-drive housing site, the contractors' and builders' machinery, plant and materials. Auctioneers, 41, Castle-street, Liverpool.

FEBRUARY 15.—**Acton.**—Messrs. Daniel Smith, Oakley & Garrard will offer for sale at the London Auction Mart (Room E.), 155, Queen Victoria-street, E.C.2, freehold building site about 36,000 feet super forming part of The Elms Estate. Auctioneers, 4 and 5, Charles-street, St. James's-square, London, S.W.1.

Public Appointments.

JANUARY 14.—**Cheshire.**—Clerk of Works required by the Cheshire County Council in connection with the Small Holdings and Allotments Committee. Mr. F. Anstead Browne, Deputy County Architect, 16, Nicholas-street, Chester.

JANUARY 16.—**London, S.W.4.**—Principal required of the London County Council School of Building, Ferndale-road, Clapham, S.W.4. Salary scale £350 to £1,000 a year by annual increments of £50. Apply Education Officer (T.1A), New County Hall, S.E.1.

NEW COMPANIES.

ABBOTT & HYDE, LTD. (177,852). Registered November 16. Architects, surveyors, land agents, &c. Nominal capital, £2,000.

WALTER COWEN, LTD. (177,785). Registered November 11. Shaftesbury-buildings, Hinckley-street, Birmingham. Hot water and sanitary engineers and decorators. Nominal capital, £5,000.

CROSFIELD & SEDDON, LTD. (177,792). Registered November 12. 7, Brewer-street, Port-street, Manchester. Builders' merchants and slating and tiling contractors. Nominal capital, £7,000.

EDGAR EVANS & Co., LTD. (177,832). Registered November 15. Builders and contractors. Nominal capital, £1,000.

F.C. CONSTRUCTION Co., LTD. (177,834). Registered November 15. Constructional engineers, &c. Nominal capital, £20,000.

JAMES ENGLAND, LTD. (177,752). Registered November 10. Joiners, builders and contractors. Nominal capital, £6,000.

GENERAL HARDWOOD Co., LTD. (177,835.) Registered November 15. 76, Bacon-street, Bethnal Green, E. Nominal capital, £1,000.

HEAVEN & KESTERTON, LTD. (177,838). Registered November 15. Queen's Dock-chambers, Queen's Dock, Hull. Timber and wood importers, merchants and agents. Nominal capital, £1,000.

E. G. HORTON & Co., LTD. (177,793). Registered November 12. 23, Karslake-road, Wallasey, Cheshire. Builders and contractors. Nominal capital, £3,000.

KELASTO & RECELT Co., LTD. (178,150). Registered December 1. 39, Victoria-street, Westminster, S.W. 1. Makers and vendors of various preparations at present carried on under the title of Kelasto and Recelt Company, and to carry on the business of manufacturers of building and engineering materials and accessories. Nominal capital, £4,600.

MAPPERLEY CINEDROME (NOTTINGHAM), LTD. (177,929). Registered November 21. Russell Chambers, King-street, Nottingham. To construct at Nottingham or elsewhere a picture-house or theatre. Nominal capital, £8,500.

MITCHAM OIL AND PAINT Co., LTD. (177,680). Registered November 4. 49, Bankside, Southwark, S.E. 1. Manufacturers and dealers in oils, lubricants, paints, &c. Nominal capital, £2,500.

C. P. MURRAY & Co., LTD. (177,768). Registered November 11. 8, Neville-street, Leeds. Manufacturer of bricks, sanitary tubes, terra-cotta work, slates, &c. Nominal capital, £10,000.

NORTHERN ASPHALT AND ROOFING WORKS Co., LTD. (177,719). Registered November 8. Cardigan-road, Leeds. Nominal capital, £30,000.

W. J. PHILLIPS, LTD. (178,191). Registered December 2. 104, Tintern-road, Handsworth, Birmingham. Builder and contractor. Nominal capital, £3,000.

PRING & ST. HILL, LTD. (177,681). Registered November 4. Constructional engineers and ironfounders. Nominal capital, £15,000.

UNI-CONSTRUCTORS, LTD. (177,669). Registered November 4. 14, Red Lion-square, W.C.1. Building contractors. Nominal capital, £2,000.

W. VANSTONE, LTD. (178,207). Registered December 3. 61, Chandos-street, W.C. Builders and contractors. Nominal capital, £6,000.

WORPLESDON SAW MILLS, LTD. (177,788). Registered November 11. Nominal capital, £1,250.

Builders' Hardware, &c., for Tripoli.

It is reported to the Department of Overseas Trade that certain buildings are in course of erection or are projected in Tripoli for which iron girders, ready-made doors with locks, handles, and hinges might possibly be imported from the United Kingdom. The report mentions the following buildings to be erected for the local Government:—Customs warehouses and lodging-house for Customs employees and two large schools, the contract for one of which has been awarded to a local firm. In addition, a large lodging house for artisans has already been commenced by another local firm. Besides these there has been erected a theatre for which interior furniture and fittings are required. A project is before the proprietors of the theatre for the addition thereto of an hotel of 100 rooms and bar. The names and addresses of the authorities and firms in Tripoli concerned in these contracts to whom United Kingdom firms interested could submit price lists, &c., can be obtained by United Kingdom firms on application to the Department of Overseas Trade (Room 84), 35, Old Queen-street, S.W. 1, quoting the reference DOT / 6814 / FE / PN.

Proposed New Hotel at Stainforth.

Plans have been approved and a licence granted for the erection of a new hotel at Stainforth, near Doncaster. The architect is Mr. F. Hopkinson, of Bridge-street, Worksop.

The Welsh National Eisteddfod Buildings.

The Executive Committee of the Welsh National Eisteddfod, which is to be held at Ammanford this year, has accepted the tender submitted by Messrs. Woodhouse & Co., of Nottingham, for the erection of the Eisteddfod pavilion. It is to accommodate fourteen thousand people, and will cost about four thousand pounds.

A Presentation.

On the occasion of his having completed a quarter of a century's service with Messrs. Stephen Easten, Ltd., builders, of Newcastle, Mr. Charles Simkins, a director, has been entertained to luncheon and presented with a number of gifts in recognition of his lengthy association with the firm. The chairman of the directors, Councillor Stephen Easten, occupied the chair and made the presentations, consisting of a silver tea and coffee service (the gift of the firm), and a mahogany clock and other presents from the staff.

The Building Guild.

It is reported that the National Building Guild (Manchester) has decided to raise a loan of £150,000 in order to put its organisation on a sounder basis. According to a Manchester daily paper, up to the present all work has been done on the joint credit of the Guild and local authorities with the help of the C.W.S. bank. Up to date the Guild has received in cash from local authorities over £500,000 on account of the £2,000,000 contracts in hand. "The time has come," an official of the Guild is reported to have said, "for the Guild to step out boldly into the ordinary work of building. It would have been comparatively easy, with such valuable contracts in hand, to have transformed our organisation into a great commercial undertaking, but the Guilds have set their faces against any such temptation. The Guild does not distribute profits; costs would be disclosed to customers, and a common form of invoice to carry out this policy is being issued. The Guild is aiming at securing £5,000,000 worth of work in 1922 and £10,000,000 worth in 1923."

Builders' Estates.

The late Mr. Morton Browne, of Chester, builder, left estate valued at £12,007.

The late Mr. Peter Tyson, of Waterloo, Lancs, builder and contractor, who built the Shakespeare Theatre, the Church House, Lord-street, the public baths and library, Bootle, the Carnegie Library, Crosby, and the Church of St. Columba, Egremont, who died on August 15, left £21,564, with net personalty £7,842.

The late Mr. T. V. Burrows, of Hoseside, Wallasey, builder and contractor, an ex-alderman and ex-mayor of Wallasey, left property of the gross value of £47,205, with net personalty £2,000.

The late Mr. Charles Joseph Wills, chairman of Messrs. C. J. Wills & Sons, Ltd., and managing partner of Messrs. Price, Wills & Reeves, public works contractors, Westminster, who carried out many large public works at home and abroad, left estate of the value of £355,585, with net personalty £346,424.

PROPOSED NEW BUILDINGS & OTHER WORKS.*

IN these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works at the time of publication have been actually commenced. Abbreviations:—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C for Rural District Council; E.C. for Education Committee; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

ALTOFTS.—Plans passed: Alterations to offices in Pope-street, for Messrs. Pope & Pearson.

AUDENSHAW.—Plans passed by U.D.C.: Two houses, Stamford-road, for Messrs. W. Prestwick & F. Woolley.

BEVERLEY.—Mr. G. Weekes has held an inquiry on behalf of the Ministry of Health, into the application of the T.C. to borrow £25,000 for works of sewerage.

BIRKENHEAD.—Plans passed by T.C.: Alterations and additions to business premises, 122, Grange-road; garage, 4, Boundary-road; extensions to the pavilion on the Oxton Cricket Ground; residential officers' quarters and for an addition to the Maternity Block in connection with the Tranmere Institution, Church-road; addition and alterations to 34, Ashburton-road; office building and sanitary conveniences to workshop, 1 to 11, Seymour-street; extension to garage and workshop, Eastbourne-road and Bentinck-place; pair of semi-detached houses, Ashburton-avenue; addition and alterations to the Royal Hotel, Woodchurch-road.

BISHOP'S STORTFORD.—Plans passed by U.D.C.: Two cottages, Dunmow-road, for Messrs. Cannon & Sons; five houses, South-road, for Mr. A. E. Markswell.

BOLTON.—Plans passed by T.C.: Messrs. Poole & Co., Ltd., for Cotton waste shed, Deane Mill; J. & C. Chorlton, for covering to yard, 148, Derby-street; Mr. Fred Bradley, for mason's shed, Back Deane Church-lane; Messrs. Wm. Tong & Sons, Ltd., for drain and cellar plan, "Falcon Inn"; Messrs. Wm. Tong & Sons, Ltd., plan of second floor, "Falcon Inn;" Mr. Edwin Brooks, for cart shed, Salop-street; Mr. T. Farnworth, for garage, 279, Wigan-road; Messrs. Warwick & Lawrence, for wooden workshop, Hereford-street; Mr. Thomas Woods, for picture theatre, St. George's-road; Messrs. Dobson & Tierney, for store shed, Back Deane Church-lane; Mr. J. T. Seddon, for converting club-room to house, Goldstein-road.

BOURNEMOUTH.—Plans passed by T.C.: Transformer chamber, 65, Palmerston-road, for the Bournemouth and Poole Electricity Supply Co., Ltd.; additions to garage, 5, Withermoor-road, for Mr. Whitmarsh; additions to house, Stokewood-road, for Messrs. G. E. & W. R. J. Lambert; motor-house, Keswick-road, for Mr. T. W. Haddon; conservatory, "Zaremba," Percy-road, for Mr. G. Roe; house and shop, Wimborne road and Bloomfield-avenue, for Mr. H. C. Barnes; garage, Wilson-road, for Messrs. Eastman's, Ltd.; house, Stourvale-road, for Mrs. C. Dudman; bungalow, Endfield-road, for Mrs. J. Steers; house, Cromer-road, Mr. J. Francis; motor house, Fitzharris-avenue, for Mr. H. Moores; house, Keswick-road, for Messrs. H. Ellison, Son & Dale; conversion into flats, "Caledon," 16, Crabton Close-road, for Mrs. Harding; house, Berkeley-road, for Mr. E. Warde; motor house, "Woodhall," St. Alban's-avenue, for Mr. Mouflet; alterations to lavatories, St. Luke's Schools, Bemister-road, for the Managers; house, Browning-avenue, for Messrs. Hawkins Bros.; additions, rear of 62, Seamoor-road, for Mr. W. G. Gubbins; conversion into lock-up shops and offices, 8, Seabourne-road, for Mr. W. Whittingham; house, cr. Keswick-road and Beechwood-avenue, for Mr. H. Solomon; shop front, 95, Seabourne-road, for Mr. C. Cox; motor house, 39, Westby-road, for Mr. W. R. Evans; house and garage, Southwood-avenue, for Mr. R. J. M. Nabney; house, Talbot-road, for Messrs. C. A. Barnes & Co., house, St. Alban's-avenue, for Mr. A. Adams; garage, 44, Shelbourne-road, for the South Coast Welding Co.; additions, "Meyrick Mansions," Hinton-road, for Mr. Clayton Lloyd; motor house "Gorsecliffe School Annexe," Spa-road, for Mrs. Peek; greenhouse, 167, Stewart's-road, for Mr. Howe.

BRADFORD.—The Tramways Committee has approved of renewals to the tramway track at an estimated cost of £86,792.

BRIDLINGTON.—Plans passed by T.C.: Mr. M. B. Parkin, shop premises in Marshall-avenue, for Mr. and Mrs. T. H. Willis; Mr. M. B. Parkin, re-conversion of 17 and 18, Kirkgate, into a cottage, for Messrs. H. E. Elsom & Co; Messrs. Walker, Son & Field, motor garage, Mayfield-road, for Mr. G. E. Cherry; Mr. J. R. Earnshaw, alterations to properties, 19 and 21, The Promenade, for Mr. F. E. Gray; Messrs. Waite & Vaux, rebuilding of premises in Prospect-street, for Mr. F. Usher; Mr. M. B. Parkin, amendments to the Bungalow Café, Sewerby Sea Defence, for Mr. G. Baker; Mr. J. R. Earnshaw, a plant-house, tool-house, &c., at North Cliff House.

BURNLEY.—The T.C. has decided to complete the purchase of the Old Hall site for the purpose of a new gasworks, and to proceed with the erection of a gasometer at an estimated cost of £80,000.

BUXTON.—The offer of the Commissioners of a free grant of £500 and a loan of £500, on certain conditions, for the repair of the Breakwater has been accepted by the U.D.C.

CIRENCESTER.—Plans passed by the U.D.C.: Extension of premises. Queen's-lane, for Mr. E. Turner: additions, 10, Chesterton, for Mr. A. F. Hobbs.

CLITHEROE.—Plans passed by T.C.: Bungalow, Henthorn-road, for Messrs. A. R. Gradwell & Sons; alterations at Railway View Inn, and at Bridge Inn, for Dutton's Blackburn Brewery Co., Ltd.; building, 77, Woone-lane, for Mr. D. Roberts; building, 7, Woone-lane, for Mr. Brown; building at the rear of Wesleyan Chapel, for the trustees; alterations at Buck Inn, for D. Thwaites & Co., Ltd.

DARLINGTON.—Tenders will shortly be invited by the North-Eastern Railway for the erecton of 200 houses on their estate at Faverdale, to house the employees who will be engaged at the new wagon shops now in course of erection.

DERBY.—The Ministry of Health have sanctioned the borrowing of £17,500 and £7,600 for laying out the new Derby Sports Ground at Osmaston Park-road.

DURHAM.—The T.C. has passed plans for a picture hall in Gilesgate, for Mr. F. Docherty.

GATESHEAD.—Plans for internal alterations to the "Seven Stars" Hotel, High-street, have been passed. Plans for the rebuilding of the "Three Tuns" Inn, Sheriff-hill, are before the Justices.

HENLEY-ON-THAMES.—Plans passed: Offices for Messrs. Hobbs & Son.

HULL.—The T.C. is forwarding plans prepared by the City Architect, for a new maternity home to the Ministry of Health. The estimated cost is £19,000. Plans passed: G. Medforth, alterations, 39, Silvester street; West Dock Timber Co., shed, Manchester-street; W. M. Wallis, workshop, 382, Holderness-road; T. Holmes & Sons, Ltd., petrol store, Campbell-street; Needler's, Ltd., alterations, Bournemouth-street; J. Sykes & Co., Ltd., alterations, "Neptune Hotel," Paragon-street; Armour & Co., Ltd., alterations, 7, Mytongate; G. & T. Earle, Ltd., bag machinery house, Wilmington; R. Dewhirst & Sons, Ltd., additions, Durham-street; F. Fargus, garage, Park-avenue; King & Co., Ltd., shed, Myton-place; Riley's Dairies, Ltd., additions, Prospect and Pearson-streets; Hull Royal Infirmary, pathological laboratory, Mill-street; T. Smedley, additions, Cheapside; J. G. Conlon & Sons, alterations, Spring Bank and Spring-street; H. Hill, workshop, Grafton-street; N. McKenzie, Ltd., additions, Princes-road; Trustees, Kingston Club, alterations, 16 and 17, Neptune-street; Hull Corporation, electricity sub-station, Danesm-lane; Jarman & Flint, alterations, Carr-lane; J. Marks, alterations, 194, Spring Bank; B. Barnaby, additions, 6, Neptune-street; F. W. Boulton, shop front, Hessle-road; S. Webster, garage, 65, Westbourne-avenue; J. A. Hewetson & Co., Ltd., drying kiln, Bright-street; British Oil & Cake Mills, Ltd., temporary stables, Foster-street; G. B. Ramsay, shed, Madeley-street; A. Barratt, alterations, 20, Newland-avenue; J. Darby, Ltd., petrol store, Garden-street; Barnett, garages, Marlborough-avenue.

LEEDS.—The T.C. has received sanction from the Ministry of Health to the borrowing of the following sums, viz.:—£5,934, for surfacing of ring road, Otley-road to Weetwood-lane; £56,022 for construction of new road, Elland-road to Gelderd-road; £128,244 for construction of new road, Buslingthorpe to Moortown; £332 for erection of unclimbable fence at the Infants' Hospital, Wyther; £4,130 for construction of sewer in Green Hill-road, Bramley.

LINCOLN.—The T.C. has decided to pave with wood the section of the High-street between Monson-street and the tramway terminus at Bracebridge, at a cost not exceeding £60,000, application to be made to the Ministry of Transport for the grant of £30,000, and to the Ministry of Health for sanction to the borrowing of the remaining £30,000.

LONDON (SOUTHWARK).—Drainage plans passed by B.C.: Mr. W. Murrell, to 237, Walworth-road; Courage & Co., Ltd., to 216–217, Blackfriars-road; H. J. Searle & Son, Ltd., to 48–53, Comus-place; Mr. A. Kennedy, to 305, Walworth-road.——The B.C. has decided to construct a new road from Pilgrimage-street to St. Stephen's-square, at a cost of £3,000.

MANCHESTER.—Plans passed: Shop front, No. 43, Market-street; alterations and additions to premises, No. 16, Oak-street, and Green-street; conversion of Theatre Royal into cinema, &c., Peter-street, Museum-street, South-street, and Windmill-street; alterations to premises, 48, Liverpool-road; alterations and additions to premises, 66-68, Fountain-street, and Booth-street; store and cart shed, Duke-street, Liverpool-road; electric motor house, Devonshire-street, Ardwick; garage, Ashton Old-road, Johnson-street, and Toxteth-street, Openshaw; repair workshop to Gas Works, Gleden-street, Bradford-road; alterations, 24, Parkfield-road, New Moston; garage, Collinson-street, Monsall-road, Newton Heath; conversion of house into shop and house, 4, Kenyon-lane, Moston; bungalow, Cleveland-road, Crumpsall; two shops and houses, Cheetham Hill-road, Cheetham; addition to store room, 99, Brunswick-street, Ardwick; wash-houses to houses, 53-55, College-road, Whalley Range; addition to corn mills, Egerton-street and Worsley-street, Hulme; ice store, Mulberry-street, Hulme. The Theatre Royal, has been acquired by Messrs. Carreras, the founder of the Blue Hall Cinemas, of London, and on Easter Monday will open as a super-cinema, with seating accommodation for 2,500. £80,000 is to be spent on reconstructing the theatre.——The City Council has decided to apply to the Ministry of Health for sanction to borrow £64,500 to construct its portion of the proposed new arterial road from Royton to Failsworth.

OXFORD.—Plans passed by the T.C.: Sanctuary, Mr. A. G. E., Administrator of the Radcliffe Infirmary, temporary extension to the laundry buildings at the Radcliffe Infirmary; Mr. W. C. Adamson, 165, Banbury-road, addition to motor garage, 165, Banbury-road; Governors of St. Peter-le-Bailey School, covered shelter and recreation room, St. Peter-le-Bailey Church, New-Inn-Hall-street; International Stores, Ltd., Mitre-square, London, E.C., addition, rear of 7, High-street.

SCARBOROUGH.—Among the improvements contemplated by the Corporation for next season are the provision of extra seating for 525 people at Peasholm Park in connection with the summer fêtes, a miniature golf course on the north side, novel outdoor entertainments on both the north and south shores, and the construction of three "all weather" hard tennis courts in the Clarence Gardens at a cost of £460.

SHREWSBURY.—The T.C. has approved a scheme for the reconstruction and doubling of the width of the existing bridge which spans the Severn on the main London-Holyhead-road, and will approach the C.C. with a view to securing its co-operation.

SOUTHEND-ON-SEA.—Plans passed: Conversion of house, 649, London-road, for Mr. H. Wright; additions, "Malacca," Northville-drive, for Mr. H. Warman; garage and additions, "Hillcrest," Chadwick-road, for Mr. H. de H. Cooper; two bungalows, Cheltenham-drive, for Messrs. H. Smith Bros.; drainage, Gordon-place, for the Midland Railway Co.; two lock-up shops, Pall Mall, Leigh, for Mr. J. Joy; stable, South-avenue, for Mrs. A. E. Farnborough; additions to garage, 4, Thorpe Bay Gardens, for Capt. Noakes; bungalow, Westcliff-drive, for Mrs. E. J. Pettitt; conversion of house into shop, 291, London-road, for Mr. A. Hedges; two flats and garage, South-avenue, for Mr. W. Letton; house, Dawlish-drive, for Mr. C. G. Ellison; house, Lindisfarne-avenue, for Mr. E. F. Selby; drainage, 19, Broadway, Leigh, for Mr. J. Lambert; conservatory, 157, Brightwell-avenue, for Mr. H. W. Wickerson; additions, "Mud End," Lansdowne-avenue, for Mr. W. Rallings; five houses, shop and store, London-road and Rockleigh-avenue, for Mr. F. M. Wardill; house, Bournemouth Park-road, for Mr. F. J. Flocm; garage, "Carnaby," Chalkwell-avenue, for Mr. W. J. Walmsley; new premises, London-road, for Messrs. W. Elam & Sons; five houses and garage, Lancaster-gardens and Grange-gardens, for Mrs. E. J. Adams; two houses and shops, Leigh-road, for Mr. L. Smith.

SOUTH SHIELDS.—The T.C. has decided to carry out repairs and renewals at Dean's Hospital, at an estimated cost of £2,400.——Plans passed by T.C. Mr. Benjamin Peel, for the Northern Press, Ltd., sub-office, Hudson-street, Tyne Dock; Mr. F. W. Newby, for Mr. R. Finn, alterations to Harton Hall, Sunderland-road, Harton; Mr. J. H. Morton, for Grand Electric Theatre Co., Ltd., canopies to Grand Electric Theatre, Ocean-road; Mr. Howard Hill, for Mr. S. F. Whittles, conversion of self-contained house, 56, Winchester-street, into flats; Mr. Howard Hill, for J. Pearlman & Sons, stabling, cart shed and garage at Deans' Coal Depôt.

TOTTENHAM.—Plans passed by U.D.C.: Factory, Tariff-road, Tottenham, for the Calumet Rubber Co., Ltd.; additions to Weber Bros. & Phillips' boot factory, West-road; sawmills, joiners' shop and timber storage sheds at Hampden Works, for Messrs. Thornborough.

WALLASEY.—Plans passed by T.C.: Six dwelling houses in Mount Pleasant-road, for Messrs. Hughes Bros.; conversion of shop in Liscard Village into two shops, for Messrs. Stanbury & Co.; motor shed, 82, Borough-road, for Mr. G. F. Williams; cart shed in Wallasey Village, for Mr. E. Webster; 14 garages and repair shop, Breck-road, for Messrs H. B. Hornby & Co.; garage, 22, Broadway-avenue, for Mr. J. H. Williams; shed, 40, Byerley-street, for Mrs. Mary Cupit; dwelling house and garage, Sunningdale-road, for Mrs. Mabel S. Benson; store and workshop, Silverlea-avenue, for Mr. G. Turner; garage, Palmerston-road, for Messrs. J. McKee & Sons; house, Derwent drive, for Mr. G. Bastock; shed, 8, Keswick-road, for Mr. R. A. Parkin; additions to house, "Woodbine Cottage," Wallasey Village, for Mr. E. Webster; garage and sheds, 15, St. George's-mount, for Mr. G. W. Clowes; garage, 25, Kingsway, for the executors of the late Mr. T. V. Burrows.

YORK.—Plans passed by T.C.: Rev. P. J. Shaw, shed, 28, Tanner-row; Mr. T. Morris, two sheds, Escrick-street; Mr. F. M. Archer, shed, 10, Lime-avenue; Mr. A. Danby, shed, Hawthorn-street; Messrs. Rowntree & Co., Ltd., garden pergola, Haxby-road; York County Hospital, ward, Monkgate; Tadcaster Tower Brewery Co., Ltd., shop and garages, Fulford-road; R. A. Wright, Ltd., alterations, Cumberland-street; Mr. S. J. Smith, workshop, Haxby-road; Mr. D. Hutchinson, workshop, Townend-street; Mr. J. Whittaker, shed, 38, Millfield-road; Mr. Wreghitt, shop front, 59, Gillygate; Yorkshire Road Tar Binders, Ltd., vehicle shelter, James-street; Messrs. Newitt & Co., roof over yard, 53, Goodramgate.——The Ministry of Health has approved of the scheme of the Acomb Hall Maternity Home and of the estimate of £2,975 for adapting the building.

FIRES.

BIRMINGHAM.—A fire has occurred at the premises of Messrs. Pullen & Co., Molend-street.

BRISTOL.—A fire has caused considerable damage at the offices of the Ministry of Pensions, in King-street.

CRADLEY HEATH.—Damage amounting to about £300 has been caused by a fire which occurred at the "Queen's Head" and "Railway Inn," Corngreaves-road.

GLASGOW.—An outbreak of fire, resulting in damage estimated at £20,000, has occurred in the block of warehouses and offices at 57, Miller-street.

HARTLEPOOL.—Damage estimated at £1,000,000 has been caused by a fire which occurred at the timber storage grounds of Messrs. George Horsley & Sons. Over 70 houses were involved.

LEICESTER.—Damage to the amount of several thousand pounds was caused by a fire at Cardon Hill granite quarry. The electric power house was completely destroyed.

MEXBOROUGH.—A fire has destroyed "Mexborough House," the Comrades' Club, the headquarters of the Mexborough branch of the British Legion.

SUDBURY (SUFFOLK).—A fire occurred last week at the premises of the "Rose and Crown" Hotel; of Mr. Winch, drapers; of Mr. H. H. Baker, draper; and of the executors of the late Mr. R. Lea, tailor.

WEST BROMWICH.—The large provision warehouses of Messrs. J. Mason, Ltd., in Thynne-street, have been destroyed by fire.

* See also our List of Contracts, Competitions, etc.

PRICES CURRENT OF MATERIALS.*

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry. Since our last issue various revisions have been made.—Ed.]

BRICKS, &c.

	£ s. d.
Per 1,000 Alongside, in River Thames up to London Bridge.	
Best Stocks	4 13 0
Per 1000, Delivered at London Goods Stations.	
	£ s. d.
Flettons	3 12 0
Do. grooved for plaster	3 14 0
Do. Bullnose	4 7 0
Best Stourbridge Fire bricks:—	
2½ in.	11 18 0
3 in.	14 2 0
GLAZED BRICKS—	
Best White, Ivory, and Salt Glazed Stretchers	26 0 0
Headers	25 10 0
Quoins, Bullnose and 4½ in. Flats	32 10 0
Best Str'tch'rs	34 10 0
D'ble Str'tch'rs	34 10 0
D'ble Headers	31 10 0
One Side and two Ends	35 10 0
Two Sides and one End	36 10 0
Splays and Squints	34 0 0

Second Quality, £1 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours, Hard Glaze, £5 10s. extra over white.

	s. d.	
Thames Ballast	14 0	per yard, delivered 2 miles radius Paddington.
Pit Sand	17 0	
Thames Sand	19 0	
Best Washed Sand	19 0	
½ in. Shingle for Ferro-Concrete	19 0	
¼ in.	20 0	

Per ton delivered in London area in full van loads.

	£ s. d.	£ s. d.
Best Portland Cement. British Standard Specification Test	3 10 6	3 13 3
63/6 alongside at Vauxhall in 80-ton lots.		
Ferrocrete per ton extra on above		10 0

NOTE.—The sacks are charged at 2s. 3d. each and credited at 2s. each if returned in good condition within three months, carriage paid.

Best Ground Blue Lias Lime 2 8 0 at rly. depot.
Grey Stone Lime 65s. 0d. per ton delivered in City and Central districts.
Stourbridge Fireclay in s'cks 37s. 8d. per ton at rly. dpt.

STONE.

	s. d.
BATH STONE—delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube	3 2½
Do. do. delivered in railway trucks at Nine Elms, L. & S.W.R., per ft. cube	3 5½
Do. do. delivered on road wagons at Nine Elms Depot	3 6½
PORTLAND STONE—	
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, L. & S.W.R., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube	4 11½
Do. do. delivered on road wagons at above stations, per ft. cube	5 0½
White Inscribed, 3d. per ft. cube extra.	

NOTE.—½d. ft. cube extra for every foot over 20 ft. *average*, and ½d. beyond 30 ft.

YORK STONE, BLUE—*Robin Hood Quality.*

	s. d.
Delivered at any Goods Station London.	
6 in. sawn two sides landings to sizes (under 30 ft. super.) Per Ft. Super	7 4½
6 in. rubbed two sides, ditto "	8 0½
3 in. sawn two sides slabs (random sizes) "	3 3
2 in. to 2½ in. sawn one side slabs (random sizes) "	2 1
1½ in. to 2 in. ditto, ditto "	1 9
HARD YORK—	
Delivered at any Goods Station London.	
Scappled random blocks Per Ft. Cube	8 0
6 in. sawn two sides landing to sizes (under 40 ft. super.) Per Ft. Super	7 0
6 in. sawn two sides ditto "	8 0
4 in. sawn two sides slabs (random sizes) "	3 11
3 in. ditto. ditto "	3 1
2 in. self-faced random flags Per Yard Super	10 6

WOOD.

GOOD BUILDING DEAL.

Inches	£ s.	
4 × 11	36 0	per standard
4 × 9	35 0	"
4 × 8	30 0	"
4 × 7	30 0	"
3 × 8	30 0	"
3 × 7	25 0	"
2½ × 7	25 0	"
3 × 6	25 0	"
3 × 11	34 0	"
2 × 11	32 0	"
3 × 9	30 0	"
2½ × 9	30 0	"
3 × 4½	20 10	"
3 × 4	20 10	"

PLANED BOARDS.

1 × 11	45 0	"
1 × 9	40 0	"

PLAIN EDGE FLOORING.

Inches		
¾	20/-	per square
⅞	22/6	"
1	25/-	"
1¼	30/-	"
1½	37/6	"

TONGUED AND GROOVED FLOORING.

Inches		
1	25/-	per square
1¼	30/-	"
1½	37/6	"

WOOD (*Continued*).

MATCHINGS (BEST).

Inches	
¾	17/6 per square
⅞	20/- "
1	25/- "

BATTENS.

Inches	s. d.	
¾ × 2	3 0	per 100 ft.

SAWN LATHS.

Per bundle	0 4 0

Dry Wainscot Oak, per ft. super, as inch	0 2 6	to	0 3 0		
¼ in. do. do.	0 1 10½	to	0 2 6		
Dry Mahogany—Honduras, Tabasco, African, per ft. super, as inch	0 2 3	to	0 3 0		
Cuba Mahogany	0 3 6	to	0 4 0		
Teak (Rangoon, Moulmein or Java), per load	52 10 0	to	55 0 0		
American Whitewood planks, per ft. cube	0 16 0	to	0 18 0		
Best Scotch Glue, per cwt.	9 5 0	to	—		
Liquid Glue, per cwt.	5 3 0	to	6 10 0		

SLATES.

1st quality slates from Bangor or Portmadoc in truck load delivered London area. Per 1,000 of 1,200.

		£ s. d.
Best Blue Bangor Slates,	24 by 12	46 10 0
" "	22 by 12	42 5 0
First quality " "	22 by 11	39 0 0
" "	20 by 12	37 2 6
Best Blue Portmadoc	20 by 10	31 15 0
" "	18 by 10	26 5 0
First quality "	18 by 9	23 2 6
" "	16 by 10	22 0 0
" "	16 by 8	17 2 6

TILES.

	Per 1,000 f.o.r. London. £ s. d.
Best machine-made tiles from Broseley or Staffordshire district	7 0 0
Ditto hand-made ditto	7 15 0
Ornamental ditto	8 0 0
Hip and valley tiles (per dozen)	0 12 0

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION PER TON—

	£ s. d.
R. S. Joists, cut and fitted	14 10 0
Plain Compound Girders	16 10 0
" " Stanchions	18 0 0
" In Roof Work	22 0 0

WROUGHT-IRON TUBES AND FITTINGS—

(Discount off List for lot of not less than £15 net value delivered direct from works. 5 per cent. less above gross discounts, carriage forward if sent from London stocks.)

	Tubes. ½" to 2".	2½" to 6".		Fittings. ½" to 2".	2½" to 6".
Gas	37½	40	..	35	40
Water	30	32½	..	30	37½
Steam	22½	25	..	25	35
Galv'd Gas	21½	25	..	27½	32½
" Water	12½	16½	..	22½	30
" Steam	3½	7½	..	17½	27½

L.C.C. COATED SOIL PIPES—London Prices ex works.

	Pipe. s. d.		Bends, stock angles. s. d.		Branches, stock angles. s. d.
2 in. per yd. in 6fts plain	5 1	..	3 7	..	4 4
2½ in. "	6 1	..	3 11	..	5 5
3 in. "	7 3	..	4 4	..	6 6
3½ in. "	7 11	..	5 5	..	7 6
4 in. "	9 1½	..	6 1	..	8 7

RAIN-WATER PIPES, &c.

	Pipe. s. d.		Bends, stock angles. s. d.		Branches, stock angles. s. d.
2 in. per yd. in 6fts. plain	3 9	..	2 2	..	3 0
2½ in. " "	4 2	..	2 7	..	3 6
3 in. " "	4 9	..	3 1	..	4 8
3½ in. " "	5 6½	..	3 9	..	5 6
4 in. " "	6 4	..	4 6	..	6 8

L.C.C. DRAIN PIPES.—9 ft. lengths. London Prices, per yd.: 4 in., 6/10. .. 5 in., 8/-. .. 6 in., 9/8.

	Per ton in London. £ s. d.		£ s. d.
IRON—			
Common Bars	15 0 0	to	16 0 0
Staffordshire Crown Bars good merchant quality	16 0 0	..	17 0 0
Staffordshire "Marised Bars"	19 10 0	..	20 10 0
Mild Steel Bars	13 10 0	..	14 10 0
Steel Bars. Ferro-Concrete quality, basis price	13 10 0	..	14 10 0
Hoop Iron, basis price	21 0 0	..	22 0 0
" Galvanised	34 0 0	..	36 0 0
Soft Steel Sheets, Black—			
Ordinary sizes to 20 g.	17 0 0	..	18 0 0
" " " 24 g.	18 0 0	..	19 0 0
" " " 26 g.	19 10 0	..	21 10 0
Sheets Flat Best Soft Steel, C.R. & C.A. quality—			
Ordinary sizes, 6ft. by 2ft. to 3ft. to 20 g.	23 0 0	..	24 0 0
Ordinary sizes, 6ft. by 2ft. to 3ft. to 22 g. and 24 g.	24 0 0	..	25 0 0
Ordinary sizes, 6ft. by 2ft. to 3ft. to 26 g.	26 0 0	..	28 0 0
Flat and Galvanised Corrugated Sheets—			
Ordinary sizes, 6 ft. to 9ft. 20 g.	22 10 0	..	23 10 0
Ordinary sizes, 6ft. to 9ft. 22 g. and 24 g.	23 0 0	..	24 0 0
Ordinary sizes, 6ft. to 9ft. 26 g.	25 0 0	..	27 0 0

METALS (*Continued*).

	Per ton in London. £ s. d.		£ s. d.
Sheets Galvanised Flat, Best quality—			
Best Soft Steel Sheets, 6ft. by 2ft. to 3ft. to 20g. and thicker	27 0 0	..	28 0 0
Best Soft Steel Sheets, 22 g. and 24 g.	28 0 0	..	29 0 0
Best Soft Steel Sheets, 26 g.	30 0 0	..	31 0 0
Cut Nails, 3in. to 6in.	26 0 0	..	27 0 0

(under 3in. usual trade extras.)

METAL WINDOWS—Standard sizes suitable for complete houses, including all fittings, painting two coats, and delivery to job, average price about 3s. per foot super.

LEAD, &c.

	Delivered in London. £ s. d.		
LEAD—Sheet, English, 4 lb. and up	36 0 0	—	—
Pipe in coils	36 10 0	..	—
Soil Pipe	39 0 0	..	—
Compo pipe	40 0 0	..	—

NOTE—Country delivery, 30s. per ton extra; lots under 5 cwt., 1s. 6d. per cwt. extra. Cut to sizes, 2s. cwt. extra.

Old lead, ex London area, at Mills per ton	22 0 0	..	—
Do., ex country, carriage forward per ton	23 0 0	..	—
COPPER—			
Strong Sheet per lb.	0 2 3	..	—
Thin " "	0 2 4	..	—
Copper nails "	0 2 3	..	—
Copper wire "	0 2 4	..	—
TIN—English Ingots "	0 1 9	..	—
SOLDER—Plumbers' "	0 0 10	..	—
Tinmen's "	0 1 0	..	—
Blowpipe "	0 1 3	..	—

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

	Per Ft.		Per Ft.
15 oz. fourths	4½d.	32 oz. fourths	9½d.
" thirds	5½d.	" thirds	11d.
21 " fourths	6½d.	Obscured Sheet, 15 oz.	7d.
" thirds	8½d.	" 21 "	9d.
26 " fourths	7½d.	Fluted and Enamelled 15 "	11d
" thirds	8½d.	" 21 "	1/2

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

	Per Ft.
¼ Rolled plate	4½d.
⅜ Rough rolled	6d.
½ Rough rolled	6½d.
Figured Rolled, Oxford Rolled, Baltic, Oceanic, Arctic, Stippolyte, and small and large Flemish white	7d.
Ditto, tinted	9½d.
Rolled Sheet	rd.
White Rolled Cathedral	5½d.
Tinted do.	7½d.

Cast Plate is same price as rough rolled.

PAINTS, &c.

		£ s. d.
Raw Linseed Oil	in pipes per gallon	0 3 2
" " "	in barrels "	0 3 3
" " "	in drums "	0 3 4
Boiled " "	in barrels "	0 3 7
" "	in drums "	0 3 9
Turpentine	in barrels "	0 6 5
"	in drums (10 gall.) "	0 6 8
Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.)		58 0 0
GENUINE WHITE LEAD PAINT— "Father Thames," "Nine Elms," "Park," "Supremus" and other best brands (in 14 lb. tins) not less than 5 cwt. lots per ton delivered		77 5 0
Red Lead, Dry (packages extra)	per ton	41 0 0
Best Linseed Oil Putty	per cwt.	0 17 6
Filocol	per cwt.	0 15 6
Size. X D Quality	per firkin	0 4 6

VARNISHES, &c.

		Per gallon. £ s. d.
Oak Varnish	Outside	0 15 0
Fine ditto	ditto	0 17 2
Fine Copal	ditto	1 1 6
Pale Copal	ditto	1 2 6
Pale Copal Carriage	ditto	1 4 6
Best ditto	ditto	1 14 6
Floor Varnish	Inside	0 19 0
Fine Pale Paper	ditto	0 18 0
Fine Copal Cabinet	ditto	1 2 6
Fine Copal flatting	ditto	1 0 6
Hard drying Oak	ditto	0 18 0
Fine Hard drying Oak	ditto	0 19 0
Fine Copal Varnish	ditto	1 0 6
Pale ditto	ditto	1 2 6
Best ditto	ditto	1 14 6
Best Japan Gold Size		0 12 6
Best Black Japan		0 18 0
Oak and Mahogany Stain (water)		0 17 6
Brunswick Black		0 11 9
Berlin Black		0 16 6
Knotting (patent)		1 16 0
French and Brush Polish		1 8 0
Liquid Dryers in Terebine		0 13 6
Cuirass Black Enamel		0 7 0

* The information given on this page has been specially compiled for THE BUILDER and is copyright. Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

CURRENT PRICES FOR BUILDING WORK IN LONDON.*

EXCAVATOR.

		s.	d.
Digging and throwing or wheeling and filling carts, and carting away to shoot—6 ft. deep	per yard cube	16	0
Add if in clay	" "	1	10
Add for every additional depth of 6 ft.	" "	1	4
Planking and strutting to trenches	per foot super	0	7
Do. to sides of excavation, including shoring	" "	1	2

CONCRETOR.

Portland cement concrete in foundation 1 to 6	per yard cube	43	0
Add if in underpinning in short lengths	" "	9	6
Add if in floors 6 in. thick	" "	3	10
Add if in beams	" "	4	9
Add if aggregate 1 : 2: 4	" "	12	0
Add for hoisting not exceeding 10 ft. beyond the first 10 ft.	" "	4	0

BRICKLAYER.

		£	s.	d.
Reduced brickwork in lime mortar and Fletton bricks	per rod	41	10	0
Add if in stocks	"	8	10	0
Add if in Staffordshire blues	"	27	0	0
Add if in Portland cement and sand	"	3	10	0

FACINGS.

Extra for facing in English or Flemish bond for every 10s. per 1,000 over the price of the common bricks	per ft. super	0	0	1½

POINTING.

Neat flat strucks or weathered joint	" "	0	0	3

ARCHES.

Extra only to the price of ordinary brickwork :—				
Fair external in half brick rings	" "	0	0	11½
Axed in stocks	" "	0	1	11
Rubbed and gauged jointed in putty camber or segmental	" "	0	6	8

SUNDRIES.

Damp course in double course of slates breaking joint and bedded in Portland cement	" "	0	1	5
Setting ordinary register grates and stoves	each	1	1	0
Setting kitchener, including forming flues, &c., with all necessary fire bricks	"	5	5	0

ASPHALTER.

		s.	d.
Half-inch horizontal damp course	per yard sup.	7	6
Three-quarter-inch vertical damp course	" "	11	8
¾ inch on flats in two thicknesses	" "	8	6
Angle fillet	per foot run	0	3
Skirting and fillet 6 in. high	" "	1	4

MASON.

York stone templates fixed	per foot cube	16	3
York stone sills fixed	" "	28	6
Bath stone and all labour fixed	" "	15	0
Portland stone fixed	" "	23	0

SLATER.

Welsh 16 in. × 8 in. 3 in. lap, including nails	per square	98	0
Do. 20 in. × 10 in. Do. Do.	"	115	0
Do. 24 in. × 12 in. Do. Do.	"	117	6

CARPENTER AND JOINER.

Fir framed in plates	per foot cube	7	0
Do. joists	" "	8	0
Do. roofs, floors and partitions	" "	8	0
Do. trusses	" "	10	6

	¾"	1"	1¼"	2"
Deal rough close boarding per sq.	42/-	48/-	56/-	85/-

		s.	d.
Flat centering for concrete floor, including struts or hangers	"	63	0
Do to beams	per ft. sup.	1	6
Centres for arches	"	2	0
Gutter boards and beams	"	1	8

FLOORING.	¾"	1"	1¼"	1½"
Deal edges shot per sq.		49/-	58/-	67/-
Do tongued and grooved "		54/-	65/-	72/-
Do. matchings "	45/-	55/-		
Moulded skirting, including backings and grounds per ft. sup.	2/-	2/3	2/9	3/3

SASHES AND FRAMES.		s.	d.
One-and-a-half moulded sashes or casements	per foot super	1	11
Two Do. Do. Do.	" "	2	4½
Add for fitting and fixing	" "	0	6
Deal-cased frames with 1 in. inner and outer linings, 1¼ in. pulley stiles tongued to linings, hard wood sills with 2 in. moulded sashes in squares double hung, double hung with pulleys, lines and weights : average size	" "	4	11

DOORS.	1½"	1¾"	2"
Two-panel square framed per ft. sup.	2/6	2/9	2/11
Four-panel Do "	2/10	3/2	3/5
Two-panel moulded both sides "	3/2	3/5	3/8
Four-panel Do. Do. "	3/6	3/9	4/-

CARPENTER AND JOINER—continued.

FRAMES.

		s.	d.
Deal wrot moulded and rebated	per foot cube	19	0

		1"	1¼"	1½"
Plain deal jamb linings framed	per ft. sup.	1/11	2/-	2/3
Deal shelves and bearers	"	1/8	1/10	2/1
Add if cross tongued	"	2d.	2d.	2d.

STAIRCASES.

	1"	1¼"	1½"	2"	2½"
Deal treads and risers in and including rough brackets	2/10	3/6	4/-	—	—
Deal strings wrot in both sides and framed	3/10	4/1	—	—	—

		s.	d.
Housings for steps and risers	each	0	11½
Deal balusters, 1 in. × 1¼ in.	per ft. run.	0	9
Mahogany handrail ; average 3 in. × 3 in.	" "	6	0
Add if ramped	" "	11	10
Add if wreathed	" "	23	9

FIXING ONLY IRONMONGERY (INCLUDING SCREWS).

6 in. barrel bolts	8½d.	Rim locks	2/4½
Sash fasteners	11½d.	Mortice locks	5/3
Casement fasteners	1/5	Patent spring hinges and letting in to floor and making good	19/-
Casement stays	1/2		
Cupboard locks	1/5		

FOUNDER AND SMITH.

		s.	d.
Rolled steel joists	per cwt.	21	0
Plain compound girders	"	24	0
Do. stanchions	"	27	0
In roof work	"	33	0

RAIN-WATER GOODS.

		3"	4"	5"	6"
Half-round plain rebated joints	ft. run	1/11	2/4½	3/7	4/-
Ogee Do. Do.	"	2/4½	3/1	3/10	4/9
Rain-water pipes with ears	"	2/9	3/7		
Extra for shoes and bends	each	4/4	5/11		
Do. stopped ends	"	1/11	2/4½	3/7	4/-
Do. nozzles for inlets	"	2/2	2/7	3/10	4/3

PLUMBER.

		s.	d.
Milled lead and laying in flashings and gutters	per cwt.	56	0
Do. Do. in flats	"	52	0
Extra labour and solder in coated cesspools	each	7	4
Welt joint	per ft. run.	0	6
Soldered seam	" "	1	10½
Copper nailing	" "	0	7

		½"	¾"	1"	1½"	2"	4"
Drawn lead waste	per ft. run	10d.	1/6	1/9	3/1	3/10	
Do. service	"	1/5	1/11	2/3	3/6		
Do. soil	"						6/2
Bends in lead pipe	each					3/3	8/2
Soldered stop ends	"	1/2	1/8	2/1	2/10	3/6	
Red lead joints	"	11d.	1/-	1/3	1/11	2/4	4/10
Wiped soldered joints	"	2/10	3/6	4/-	4/11	6/6	9/9
Lead traps and cleaning screws	"				14/7	19/6	
Bib cocks and joints	"	6/4	9/7	15/4	41/-		
Stop cocks and joints	"	15/4	17/2	25/8	64/-		

PLASTERER.

		s.	d.
Render, float and set in lime and hair	per yard sup.	3	2
Do. Do. Sirapite	" "	3	7
Do. Do. Keen's	" "	4	9
Add sawn lathing	" "	1	11
Add metal lathing	" "	3	4
Portland cement screed	" "	2	9
Do. plain face	" "	4	6
Mouldings in plaster	per 1 girth	0	3
One-and-a-half granolithic pavings	per yard sup.	6	7

GLAZIER.

		s.	d.
21 oz. sheet plain	per foot sup.	1	1
26 oz. Do.	" "	1	4
Obscured sheet	" "	1	8
⅛ in. rolled plate	" "	1	0
¼ in. rough rolled or cast plate	" "	1	1
¼ in. wired cast plate	" "	1	7

PAINTER.

		s.	d.
Preparing and distempering, 2 coats	per yard sup.	1	3
Knotting and priming	" "		8
Plain painting 1 coat	" "	1	0
Do. 2 coats	" "	1	9
Do. 3 coats	" "	2	6
Do. 4 coats	" "	3	3
Graining	" "	2	8
Varnishing twice	" "	2	0
Sizing	" "	0	4
Flatting	" "	0	8
Enamel	" "	1	6
Wax polishing	per foot sup.	0	10½
French polishing	" "	1	3
Preparing for and hanging paper	per piece 2/- to 5/-		

* These prices apply to *new buildings only*. They cover superintendence by foreman and carry a profit of 10% on the prime cost without establishment charges. A percentage of 1½ should be added for Employers' Liability and National Health and Unemployment Acts and from 1s. 6d. per £100 for Fire Insurance. The whole of the information given on this page is copyright.

TRADE NEWS.

Mr. W. Rutherford, formerly Managing Director of Messrs. Dick, Kerr & Co., Ltd., and subsequently of the English Electric Co., Ltd., has been elected a Director of Messrs. G. D. Peters & Co., Ltd.

The British Engine, Boiler & Electrical Insurance Co., Ltd., of 24, Fennel-street, Manchester, has published a booklet entitled "Breakdown of Electrical Plant," giving particulars of its services. Copies will be sent on application to those interested.

Messrs. Associated Equipment, Ltd., of Walthamstow, E.17, are exhibiting a tip-wagon, a char-à-banc, and a single-deck omnibus at the Motor Show to be held in Glasgow from January 27 to February 4 next; their Scottish agents are the Peric Motor Co., of 5, Alva-street, Edinburgh.

Messrs. H. & C. Davis & Co., Ltd., of 1, The Pavement, Clapham Common, S.W.4, have issued a catalogue of sixty-four pages illustrating an extensive range of modern locks and door furniture; all the items are priced. The firm specialises in planning complete lock and door furniture equipments for hotels, flats, public buildings, &c.

The British Emaillite Co., Ltd., in order to consolidate their manufacturing processes, are transferring the whole of their cold process works, together with the registered and general offices, from Hythe-road, Willesden, and Regent-street, W., to Brentfield-road, Stonebridge-park, Willesden Junction, N.W.10, where new extensions have been erected to provide the additional facilities. In our last issue this notice of removal was wrongly stated.

We have received some descriptive literature regarding "Sylvadure" wood preservative. The sole manufacturers, Messrs. Wm. Maclean, Sons & Co., of 127, St. Vincent-street, Glasgow, London, and Manchester, claim that it is a thoroughly efficient and economical preservative, which would seem to be borne out by the numerous testimonials they have in their possession. They state that amongst other jobs it has been specified in connection with the Corporation of the City of Glasgow housing schemes.

A new stove, the "Supremus," has been put on the market by Messrs. Young & Marten, Ltd., of Stratford, E.15. Constructed of cast and wrought-iron, this portable stove is designed on a new principle which is claimed to give four times more heat per unit of fuel for its size than any other solid-fuel consuming stove. It will burn coal, coke, anthracite, peat, and slack, and consumes its own smoke when alight. It is made 36 ins. high and in diameters of 8 in., 10 in., and 12 in., with heating capacities of 5,600 cu. ft., 7,000 cu. ft., and 8,400 cu. ft. respectively.

The National Radiator Co., Ltd., of Hull, have issued some new insets for insertion in their current catalogue, dealing with the "Ideal Classic" four and six-column and "Ideal Classic" wall radiators, "Ideal" towel rails Nos. 12 to 12c, and "1-H" series boilers and headers for use in connection with the boilers. The No. 12 towel rail is similar in design to the No. 10 already listed in the catalogue, but is provided with flanges at the top to permit of screwing the rail to a wall. The "1-H" series boilers are constructed on similar lines to the "G" series, with water-cooled grate-bars and patent insulated steel jacket. They are available both for steam and water.

Having accepted the position of Managing Director to Messrs. R. Melhuish, Ltd., tool and hardware merchants, of Fetter-lane, E.C., Mr. C. E. Speight has resigned his position of Sales Director to Messrs. Stanley Jones & Co., Ltd., and the Brilliant Sign Co., Ltd., and will therefore be taking no active part in these companies after the end of this month. The sales section of Messrs. Stanley Jones & Co., Ltd., in future will be under the control of their Works Director, Mr. W. D. Lambert, who will be assisted by Mr. S. J. Meadows, late senior representative to the Library Bureau, of 4, Cheapside, E.C., and Mr. E. C. Roe.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach him not later than Tuesday evening.

*Denotes *accepted*. † Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modifications*.

ABERGAVENNY.—For erection of 16 houses, for the T.C. :—
*Building Guild, Ltd., Cardiff..... £10,620
(12 *at* £654 *and* 4 *at* £693.)

BIRKENHEAD.—Painting railings at Victoria Park, &c., for the T.C. :—
*J. Inglis, Birkenhead..... £266

BRADFORD.—Supply of sundry valves and fittings for Challow Heights Filtration Works, for the T.C. :—
*Glenfield & Kennedy £2,236 12 10

BRIDLINGTON.—For building wall at Priory Churchyard, for the T.C. :—
*E. Dale, Bridlington..... £216 4

BRISTOL.—For supply of stores for six months to the Sanitary and Improvements Committee of the T.C. :—

*Bristol Sand & Gravel Co.—Portland cement	84s. per ton		
*Andrew Knowles & Co.—Ditto	Ditto		
*Thos. Cox & Son—Drain pipes..	£912	17	9
*John Russell & Co., Ltd.—Lead pipe and plumbers' sundries	1,268	4	4
*H. Sampson & Sons, Ltd.—Castings	539	17	0
*W. D. Patterson & Son—Ironmongery	778	12	8
*Clark & Harrison, Ltd.—Canvas, yarn and twine	243	7	2
*W. R. Harris & Sons—Paints..	484	1	9
*First Anglo-Russian Oil Co., Ltd.—Oils, grease, &c., Schedule 3	103	13	2
*Ditto ditto—Schedule 4....	176	17	11
*W. R. Harris & Sons—Oils, grease, &c.—Schedule 5 ..	486	17	1
*Pilkington Bros., Ltd.—Glass..	191	10	3
*W. H. Vowles & Sons, Ltd.—Brushes	277	11	6
*E. A. & W. Greenslade, Ltd.—Bass brooms and horse rotary refills	418	0	0
*Ditto ditto—Motor rotary brushes refills	110	5	0

BURY ST. EDMUNDS.—For the construction of reinforced concrete floor and parapet to the small bridge, Kenny Hill, on the Mildenhall-Littleport main road. Mr. W. Lionel Jenkins, County Surveyor, Bury St. Edmunds :—

R. J. May, Norwich.....	£342	0	0
Hinnels & Son, Ltd., Bury St. Edmunds	315	6	6
H. G. Frost, Bury St. Edmunds..	248	0	0
Clarke Bros., Mildenhall.....	247	14	0
E. Howes, Bury St. Edmunds..	237	6	0
*C. Maldwell & Co., Ltd., Stowmarket	234	19	6

CAMBRIDGE.—For bridge painting, for the T.C. :—

‡A. Jones, Cambridge	£190	0
‡Perry, Leach & Son, Cambridge	69	14
‡Bennett & Blowers, Cambridge	58	0

CARNFORTH.—For laying sewers on Kellett-road site, for the U.D.C. Mr. N. D. Preston, Surveyor, 56, Lancaster-road, Carnforth. Quantities by Surveyor :—

Newsholme & Winder, Ingleton (Yorks)	£972	18	6
J. Johnson, Lancaster	914	15	10
P. Trentham, Ltd., Edinburgh ..	815	10	0
W. Mulcaster, Haslington, near Crewe.....	533	15	0
G. Boak, Carnforth	499	10	0
‖R. L. Dilworth, Lancaster	414	6	10

‖*To be amended and forwarded to the Minister of Health.*

DURHAM.—For repairs at Town Hall, for the T.C.
*D. Elliott £178

EASINGTON.—Construction of reservoir at Thornley, for R.D.C. :
*Brimms & Co., Newcastle-on-Tyne .. £9,673

EDINBURGH.—Construction of sewer from Lochend Meadows to Seafield, for the T.C. :—
*Symington & Sons, Glasgow..... £50,407

EDINBURGH.—Supply of cast-iron pipes to the Water Dept., for the T.C. :—
*Macfarlane, Strang & Co., Glasgow.... £5,778

ESSEX.—For the erection of farm buildings on the Eastwoodhey Estate, for the C.C. :—
*Myall Bros. £4,158

GLOUCESTER.—For work in connection with the extension of the Electricity Works, for the T.C. :—
J. Byard & Son, Gloucester..... £2,687
*Building Guild, Ltd., Manchester.... 2,690

ILFORD.—Supply of two water carts to the U.D.C. :—
*Ham, Baker & Co. .....each £57 10

KEIGHLEY.—For materials, for the Waterworks Dept. of the T.C. :—

*Glenfield & Kennedy, Kilmarnock, sluice valves	£1,153
Cochrane & Co., Middlesbrough, pipes and castings	2,081

LEEDS.—For completion of 88 houses partly constructed by the Waller Housing Corporation on the Cross Gates Estate, for the T.C. :—

*W. Airey & Son, Ltd. ..	54 houses	£15,800
	34 ,,	19,200

LEEDS.—Construction of overhead tank at Moortown, for the T.C. :—
*Yorkshire Hennebique Co..... £3,298

LEYTON.—For supply of corrugated steel shelter for children's playground, for the U.D.C.
*J. Elwell, Ltd., Birmingham..... £142

LONDON.—The Southwark B.C. has renewed the following contracts for three months :—
*Val de Travers Asphalte Paving Co.—Asphalte, bitumen, &c., at same prices.
*J. & B. Martin and Thames Sand Dredging Co.—Ballast, sand, &c., at same prices.
*Levett, Frank & Co.—Oils, colours, &c., at 5 per cent. off present prices.
*W. H. Willcox & Co., Pryke & Palmer, and Middleton Bros.—Oils, colours, &c., at present prices.

LONDON.—For the erection of fourteen new flats at rear of 10 & 11, Warltersville-road, for the Islington B.C. :—

Ginn, R., & Son, Hertford....	£14,990	0	0
Bennett, Geo., Hornsey.....	14,640	0	0
Small & Sons, Ltd., Clerkenwell	14,283	2	1
Reader, Richard A., Hackney	13,765	15	0
Gladstone, W., Wimbledon....	13,700	0	0
Mather, J. C., N.1.....	13,534	0	0
Rowley Bros., Wood Green....	13,430	0	0
Parker, W. J., Ltd., Westminster	13,267	0	0
Perry Bros., E.C.....	12,837	0	0
Building and Maintenance Dept. of the Council.....	12,702	11	0
Pattinson, W., & Sons, Ltd., Westminster.....	12,450	0	0
Hooper & Hooper, Highgate..	12,433	0	0
Sabey & Son, N.1.....	11,891	0	0
Guild of Builders, Ltd., W.C...	11,875	0	0
Walter Jones, & Sons, Westminster	11,637	0	0
Bollom, George, Acton	11,497	0	0
Shillitoe, Thomas, Norwood..	11,300	0	0
*Peppiatt, C., Chiswick.....	11,169	0	0
Webster, Walter W., Northampton	11,111	1	1

LONDON.—For repairing the exterior of the Town Hall, for the Islington B.C. :—

Randall & Sons, Holloway.....	£460
Stevens & Son, Crouch-hill	374
*Building and Maintenance Department	300

LONDON.—For taking up existing wood pavement and laying clinker asphalte macadam to carriageway, at Stamford-hill, for the Hackney B.C. :—
*H. V. Smith & Co., Westminster, at 14s. 9d. per square yard.

LONDON (ISLINGTON).—For erection of municipal offices, for the Islington B.C. :—

S. E. Moss, Southend-on-Sea	£73,500	0	0
C. P. Roberts & Co., Ltd., Dalston	72,000	0	0
W. E. Davey & Co., Ltd., Southend-on-Sea	70,924	0	0
Walter Jones & Sons, Westminster	67,972	11	0
Wm. Saint, Ltd., Cambridge	67,523	0	0
Unit Construction Co., Ltd., W.1	66,193	0	0
Walter Jones & Sons, Acton Vale	66,122	0	0
Dove Bros., Islington	65,906	0	0
R. Marton Hughes, Baron's-court	65,829	0	0
John Willmott & Sons, Ltd., Hornsey	65,724	0	0
Holland & Hannen & Cubitts, Ltd., W.C.1	65,376	0	0
Galbraith Bros., Ltd., Camberwell	65,250	0	0
Griggs & Son, Westminster ..	65,000	0	0
F. D. Huntingdon, Ltd., W.1.	64,837	0	0
Perry & Co. (Bow), Bow	64,786	0	0
Guild of Builders, Ltd., W.C.1	64,576	0	0
Ashby & Horner, Ltd., E.1 ..	64,400	0	0
G. Miskin & Sons, Ltd., St. Albans	64,200	0	0
H. Lacey & Son, Luton	64,100	0	0
Perry Bros., E.C.	63,987	0	0
Leslie & Co., Ltd., Kensington	63,875	0	0
F. G. Minter, S.W.15	63,770	0	0
Alban Richards & Co., Ltd., S.W.....	63,500	0	0
Slade & Co., Ltd., N.1.	63,400	0	0
Thomas & Edge, Woolwich..	63,140	0	0
Allen Fairhead & Son, Enfield	63,000	0	0
W. H. Gaze & Sons, Ltd., Kingston-on-Thames.....	62,987	0	0
Youngs Construction Co., Ltd., Islington	62,975	0	0
Sabey & Son, N.1	62,959	0	0
W. G. Tarrant, Ltd., Byfleet	62,693	0	0
Thos. Shillitoe, Upper Norwood	62,629	0	0
W. J. Maddison, Ltd., E.1....	62,463	0	0
Seymour Construction Co., Ltd., Barking	62,285	12	5
Rice & Son, Stockwell	62,052	0	0
Godson & Sons, Ltd., Kilburn	62,000	0	0
J. E. Johnson & Son, Ltd., Leicester	61,980	0	0
Laing & Son, Ltd., W.C.	61,302	0	0
Patman & Fotheringham, Islington	61,221	0	0
*Building & Maintenance Dept., Islington	61,000	0	0
George Bollom, Acton	60,577	0	0
W. J. Parker, Ltd., Westminster	59,936	0	0

MANCHESTER.—For the supply of steel tubes, for the Waterworks Dept. of the T.C. :—

*British Mannesmann Tube Co. .. £426,000

NEWMARKET.—For the Soham Waterworks scheme, the R.D.C. has resolved that one of the following two tenders for the iron work should be accepted provisionally :—

Cochrane & Co., Ltd., Middlesbrough	£5,104	9	4
Staveley Coal & Iron Co., Chesterfield	5,122	0	0

And one of the two following tenders for the general contract :—

Wm. Lane, Birmingham	£4,140	18	0
Hanney Bros., Ely	5,025	17	0

the engineers (Messrs. Sands & Walker) to decide in each case which tender should be accepted.

ROCHESTER.—For extension to the Rochester Technical Institute, for the Kent Education Committee. Mr. W. H. Robinson, F.S.A., County Education Architect, Sessions House, Maidstone :—

Davis & Leaney, Goudhurst	£2,876	0	
John Harrison & Co., Camberwell	2,627	3	
William Harbrow, Ltd., S.E.16	2,569	0	
J. W. Leech, Rochester	2,555	0	
F. Tanner & Son, Old Brompton	2,512	0	
J. A. Davison, West Malling	2,508	0	
A. Thornborough, Ltd., Tottenham	2,500	0	
R. Corben & Son, Maidstone	2,496	0	
G. E. Wallis & Sons, Ltd., Maidstone	2,496	0	
Geo. Gates & Sons, Rochester	2,432	0	
H. Friday & Sons, Erith	2,375	0	
West Bros., Ltd., Strood	2,343	0	
Norman Smith & Son, Maidstone	2,312	0	
C. E. Skinner & Son, Chatham	2,298	0	
A. Knowles, Farningham	2,291	0	
Thomas & Edge, Woolwich	2,280	0	
Cox Bros., Maidstone	2,255	0	
W. J. Parker, Ltd., S.W.1	2,227	0	
Barden & Head, Maidstone	2,200	0	
A. G. Webb, Rochester	2,175	0	
G. Browning, Canterbury	2,140	0	
*A. Merton Hughes, W.	2,081	0	

ROTHERHAM.—For erection of 120 houses on Doncaster-road site, for the T.C. :—

*S. Higton & Sons, Sheffield £61,970

SHEFFIELD.—Erection of transformer sub-station in London-road, for the T.C. :—

*M. J. Gleeson £195

SHEFFIELD.—Construction of footpath to give access from Club Mill-lane, Neepsend, to the Great Central Rly., for the T.C. :—

*K. Holst & Co. £1,760

SHEFFIELD.—For painting of exterior of Queen's-road Depot, for the T.C. :—

*F. A. Tinker & Sons £290

SHEFFIELD.—For supply of plant for new refuse disposal works, for the T.C. :—

Peter Brotherhood, Ltd., Peterborough (engine)	£4,374
Crompton & Co., Ltd., Chelmsford (dynamo)	3,030
Geo. Bullock, Manchester (condensers and piping)	1,289

SHEFFIELD.—Erection of houses on Stubbin Estate, for the T.C. :—

*W. Malthouse, Sheffield (34 houses) .. £17,904 18 4
*S. Highton & Sons, Sheffield (16 houses) 8,446 0 0

SHEFFIELD.—Supply of 50,000 best pressed brindled bricks, for the T.C. :—

*Hepworth Iron Co., Hezleteed £375

SOWERBY BRIDGE.—For work in the erection of a shelter, sanitary conveniences, &c., at the recreation ground, Beech, for the Sowerby Bridge U.D.C. Mr. J. Eastwood, Surveyor, Council Offices, Sowerby Bridge :—

Mason and Bricklayer—
F. Pickles, Halifax.
Carpenter and Joiner—
E. Hanson, Sowerby Bridge.
Plasterer—
Robinson Bros., Sowerby Bridge.
Plumber—
J. U. Hemingway, Sowerby Bridge.

WOOD-BLOCK FLOORING, PARQUET FLOORING and END-GRAIN PAVING fixed complete in any locality. PARQUET and HARDWOOD DANCING FLOORS a speciality.—Send particulars of requirements to STEVENS & ADAMS, Ltd., Victoria Mill, Point Pleasant, Wandsworth, S.W.18. Telephone: Putney 1700.

J. GLIKSTEN & SON
LIMITED
Specialities in
SEASONED HARDWOODS
MAHOGANY WALNUT
JAPANESE, AMERICAN and WAINSCOT OAK, TEAK, WHITEWOOD, &c.
REGISTERED OFFICE AND WHARF:
CARPENTERS RD.
STRATFORD
LONDON E.15
Telephone: EAST 3771 (5 lines)
Telegrams: GLIKSTEN 'PHONE LONDON.

J. J. ETRIDGE, JR. Ltd
SLATING AND TILING
SLATE MERCHANTS
CONTRACTORS.
Inspections and Reports made on
OLD OR FAULTY ROOFS
in any part of the country.
Telephone: Avenue 4940 (two lines), or write
Bethnal Green Slate Works,
BETHNAL GREEN LONDON E.

500 SQUARES OF DRY JAPANESE
OAK FLOORING
@ 120/- PER SQUARE, P.T. & G.
1 in. THICK × ANY WIDTH.
SYDNEY PRIDAY
& SONS. ESTD. 1880.
25, Monument Street, E.C.3
Telephone Nos.: MINORIES 1162 (2 lines)

FITZPATRICK & SON
MASONS and PAVIORS
REDRESSED GRANITE SETTS AND KERB
Equal to New
GRANITE SETTS
supplied and laid at per yard super
Quantities Old Wood Blocks & York Flagging
SPURSTONES AND STEPS
LEALAND ROAD :: N.15
Tel. No.: Dalston 2723.

Established 1899. *Estimates Free.*
LINO-LIKE JOINTLESS COMPOSITION FLOORING MANUFACTURER, Wall and Floor Tiling Contractor. Terazzo, Roman and Ceramic Mosaic Pavoir.
O. TRAMONTINI, 551, LONDON ROAD SOUTHEND-ON-SEA

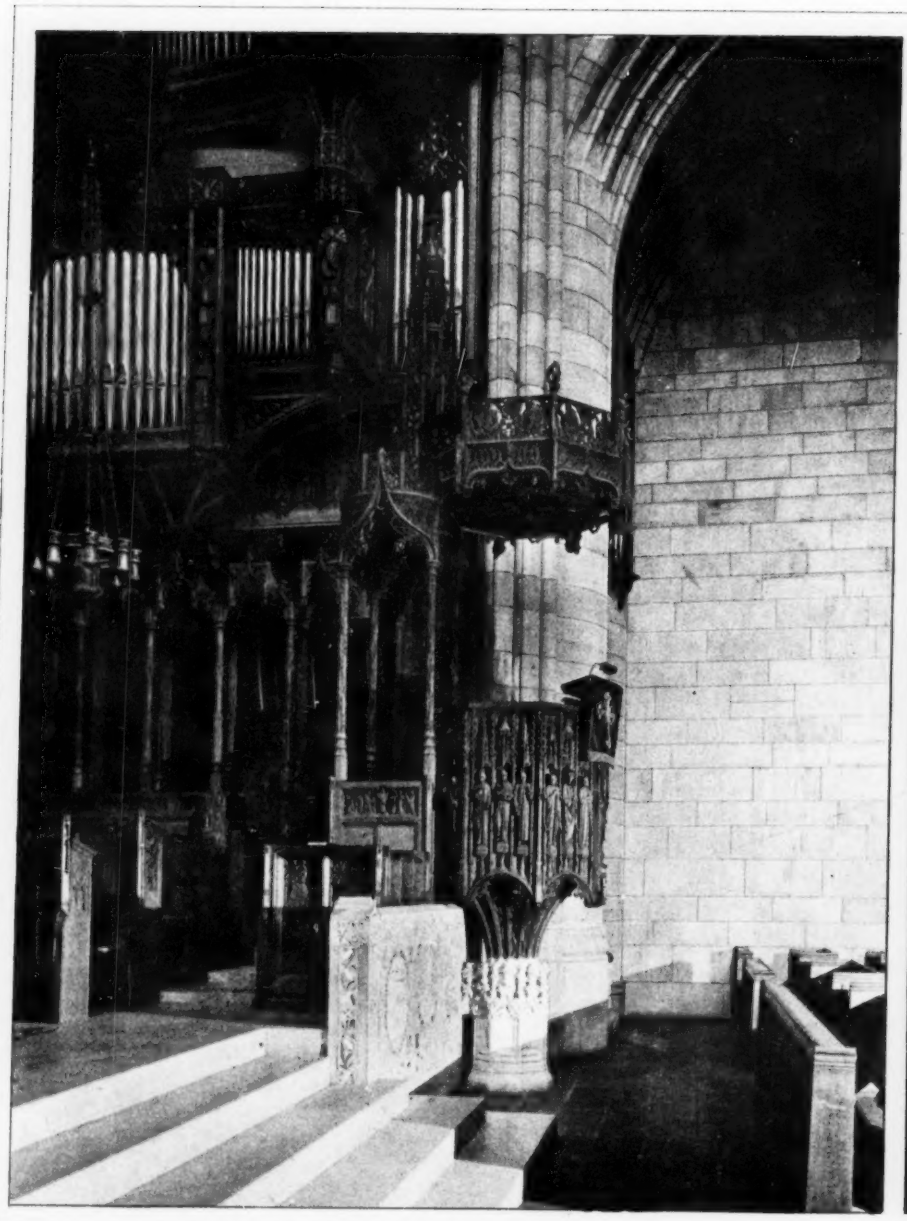
BLOCK FLOORING
in MAPLE, Oak, Pitch Pine, etc. 9 in. x 3 in. x 1½ in. and all Sizes. Manufactured at our own English and Canadian Mills. Thoroughly dry and reliable.
MITCHELL BROS., Marsh Lane, Bootle

Hospital & School Stoves
MAKERS OF
WRIGHT'S IMPROVED and also SHORLAND PATENT WARM AIR VENTILATING PATTERNS.
GEO. WRIGHT (LONDON) LIMITED,
19, Newman St., Oxford St., London, W.1.
Burton Weir Works, Rotherham.

BRABY'S GALVANIZED

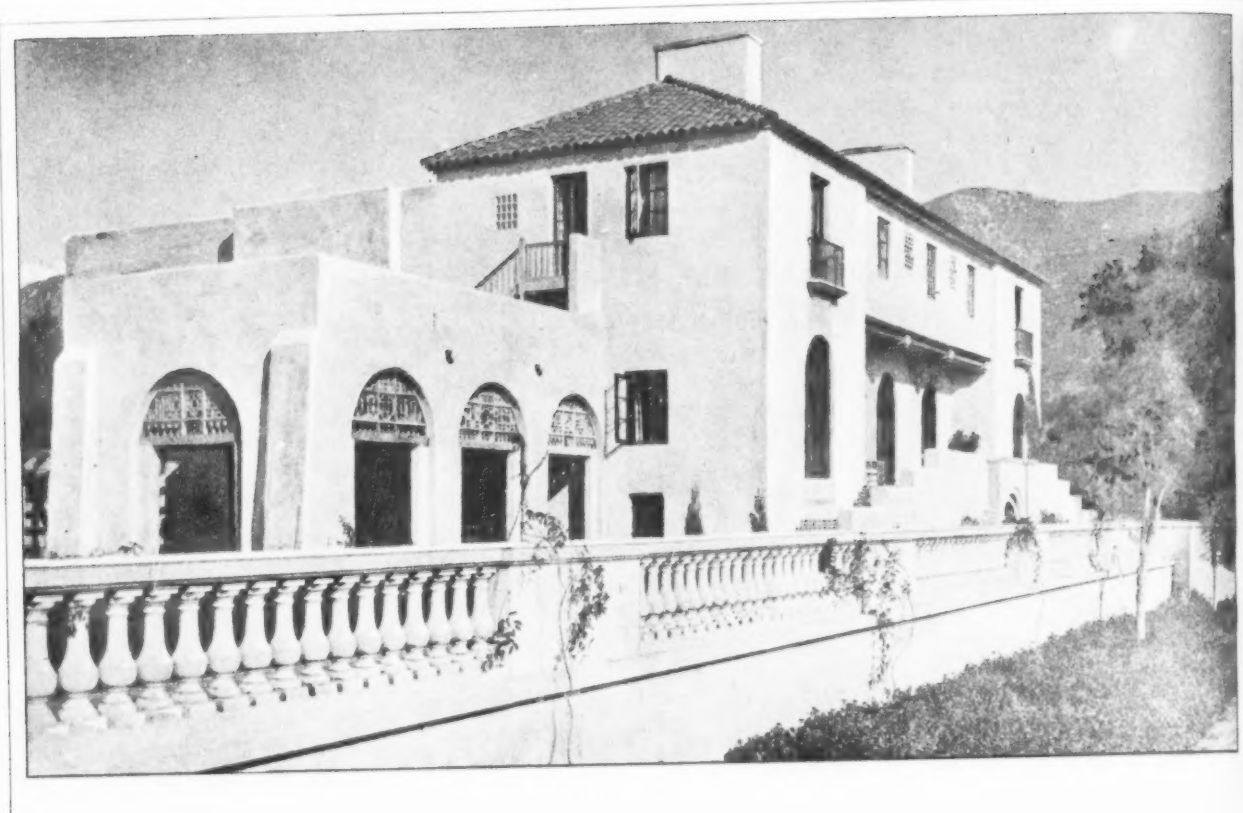
Works:
LONDON
DEPTFORD
LIVERPOOL
BRISTOL
GLASGOW
FALKIRK

Chief Offices:
352 to 364
Euston Rd.
London,
N.W.1

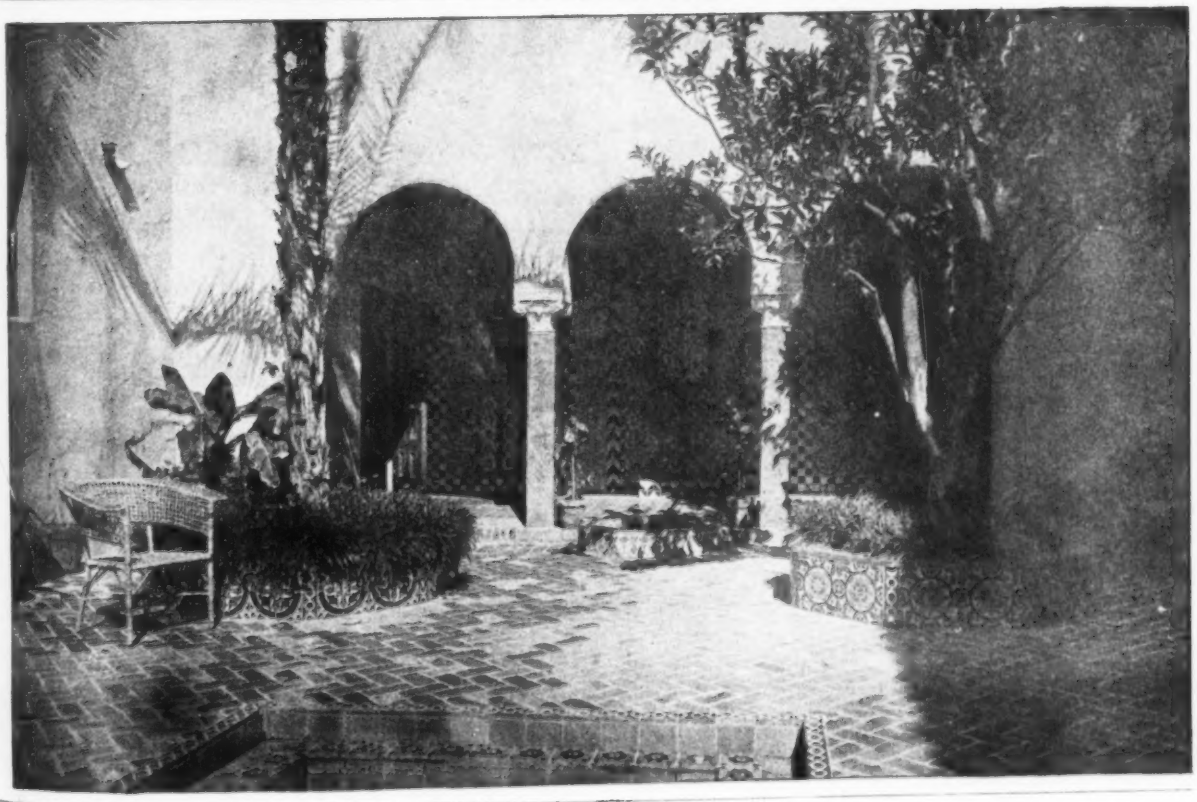


ST THOMAS'S CHURCH, FIFTH AVENUE & 53RD STREET, NEW YORK CITY

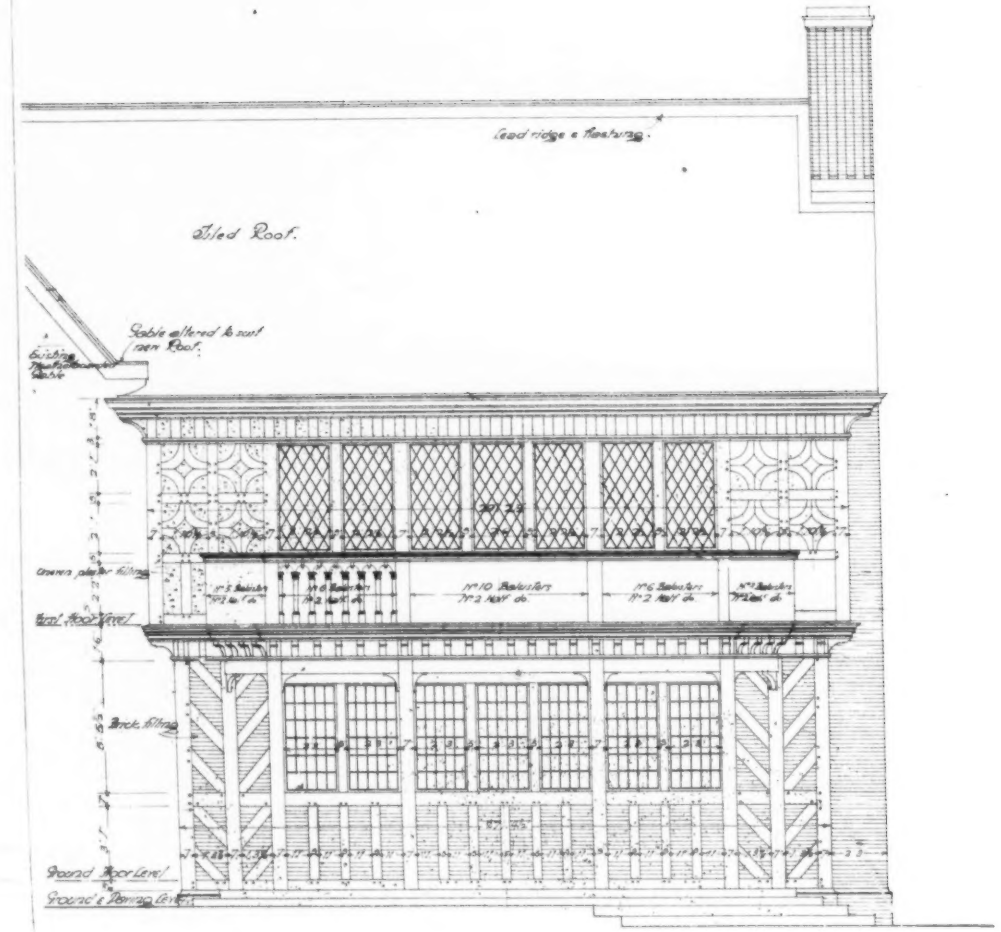
TREET, NEW YORK CITY. MESSRS. CRAM, GOODHUE & FERGUSON, ARCHITECTS.



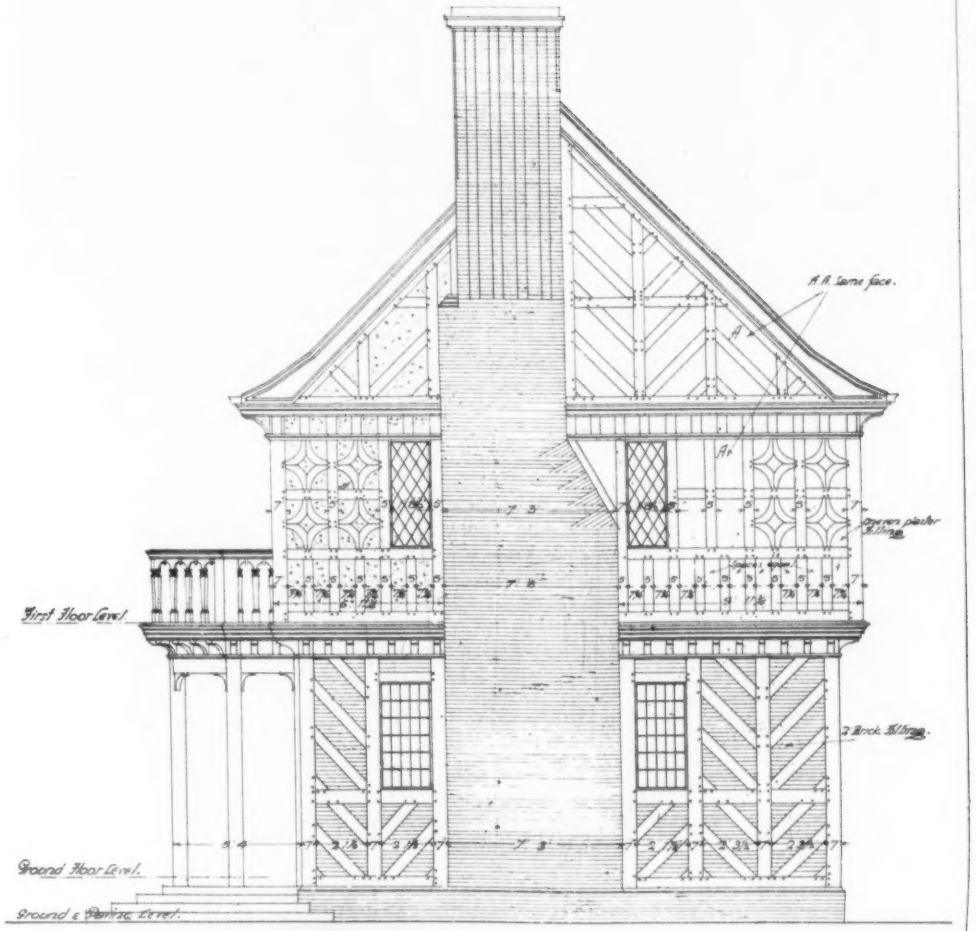
HOUSE AT MONTECITO, SANTA BARBARA, CALIFORNIA.



BARA, CALIFORNIA. MR. BERTRAM G. GOODHUE ARCHITECT.



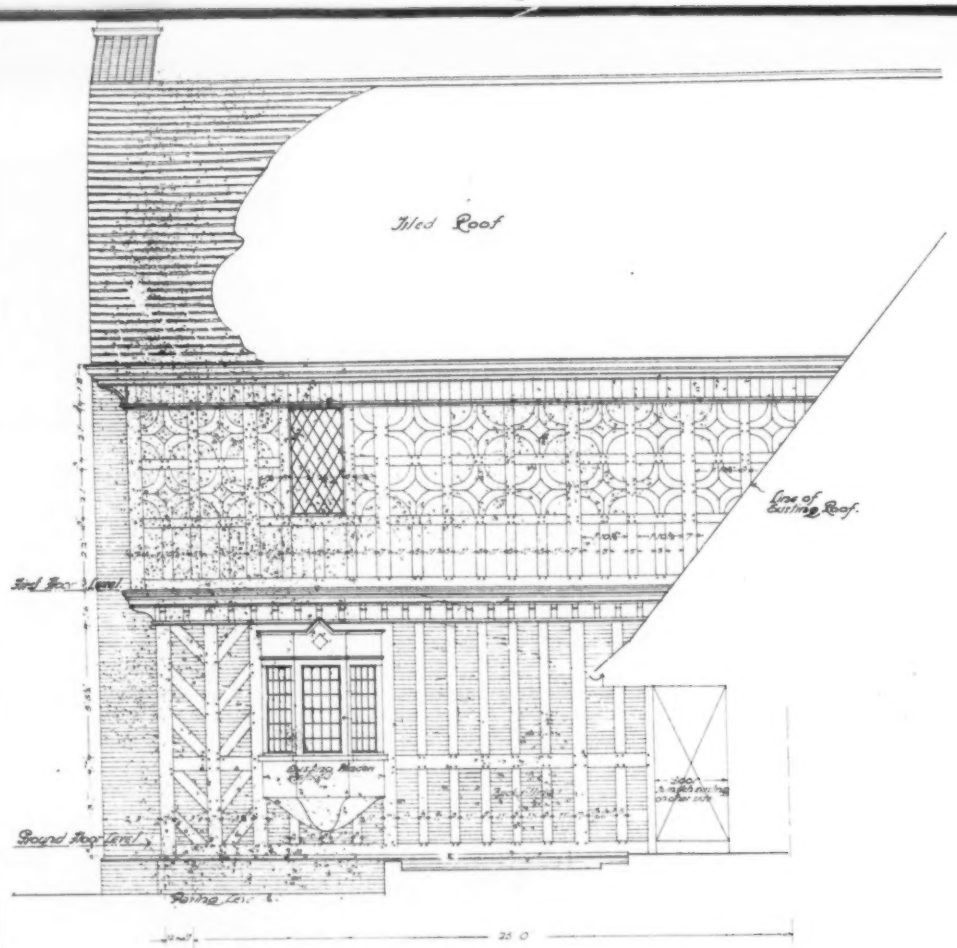
Elevation facing Garden.



South Elevation.

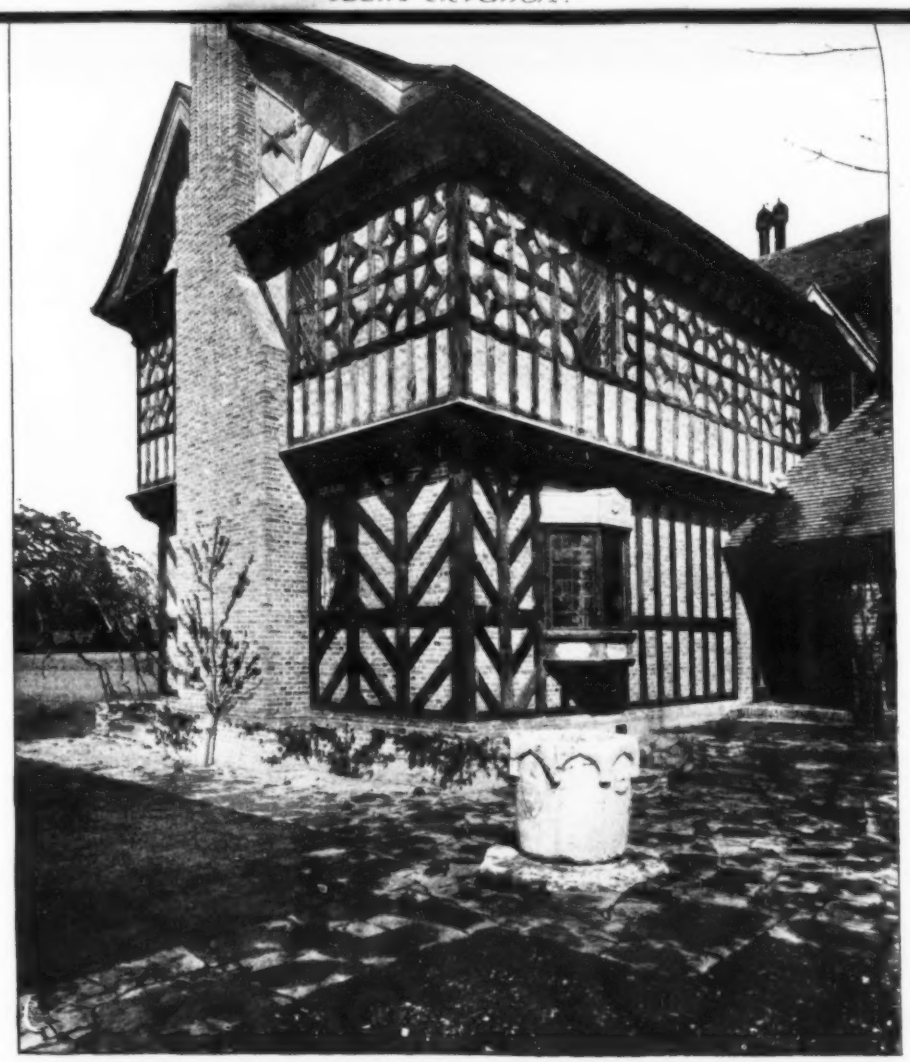
Elevation facing Garden.

South Elevation.



Elevation facing Common.

Drawing No 7. Scale: ½ Inch to 1 Foot.
Date Dec: 1919



COMMONWOOD HOUSE, CHIPPERFIELD: ADDITIONS. MESSRS. BENNETT & HOSSACK ARCHITECTS.